

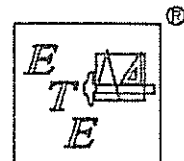
**Drainage Report For Chipaway Solar Farm
Off Of Chipaway Road (Map 247 Lot 5 & Map 252 Lot 1)
Freetown, MA**

Applicant: Just Solar LLC.
Justin Alves - Manager
150 John Vertente Blvd.
New Bedford, MA 02745

Project No. 0626-007B

February 2021

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**DRAINAGE NARRATIVE
TO ACCOMPANY SITE PLAN APPLICATION OF
JUSTIN ALVES - MANAGER, JUST SOLAR, LLC
OFF CHIPAWAY ROAD (MAP 247, LOT 5 & MAP 252, LOT 1)
FREETOWN, MA**

Located on portions of a four hundred twenty one (421⁺) acre site consisting of two parcels identified as Lot 5 on the Freetown Assessors' Map sheet 247 and Lot 1 on Map 252, the proposed project involves the development of a solar farm for harnessing, converting, and distributing electric energy through the existing power grid/network.

At present, the site is predominantly comprised of a mix of wooded uplands, open grass fields that abut numerous operational cranberry bogs, and wetlands resource areas; a barn is located within the interior of the land. The wetland resource areas include: bordering vegetated wetlands (BVW), cranberry bogs, surface water bodies, Fall Brook and several unnamed perennial streams. The site is located within the General Use District. Residential land uses, industrial land uses, and undeveloped wooded lots abut the site. An unpaved cart path hereinafter Cart Path 'A' which traverses Lot 36 shown on Assessors' Map 241 in a north-south orientation is intended to serve as access from Chace Road to the site. Cart path 'A' intersects Chace Road approximately 350 feet easterly of the western site boundary and runs southerly approximately 5,650 feet to the southern lot boundary where it reaches the parcel of land identified as Assessors Map 252, Lot 1. The topography is characterized by a low rolling terrain, ranging from a relatively level in the open field and bog areas in the central regions, to undulating terrain with slopes up to 8 percent within isolated portions of the site.

The proposed solar farm is to be located within two separate upland portions of the site and are named Array 'A' and Array 'C'. The previous project layout included Arrays 'A', 'B', and 'C'. In the project's current configuration, Array 'B' formerly covering approximately 3 acres has been removed in its entirety from the project and Arrays 'A' and 'C' have undergone significant reductions in aerial extent.

The electrical interconnection of the PV Arrays will be accomplished via a combination of above ground electrical wiring attached to wooden utility poles and underground electrical conduits. Underground electrical lines will be installed solely within the footprint of the array areas to connect the individual solar panel table units to their respective transformers and inverters. Above ground wiring will be utilized along all other routes of the electrical interconnection between Chace Road and Arrays A and C and specifically will run along Cart Path 'A'.

The Town of Freetown encourages a 25 foot no activity setback from wetland resources areas. The majority of site activities including the installation of the solar panels and regrading of the subsoil will be located at least twenty five (25) feet from the BVW. The plan sheets outline the 25, 50, and 100 foot setbacks from the wetland resource areas at those locations that directly impact the proposed project. In general, only the proposed tree clearing, and occasional sections of the perimeter security fencing are located up to the 25 foot wetlands setback. A few exceptions to the foregoing are described below and arise due to the shape and topography of the land.

Cart path 'A' currently serves as primary access across the site is generally elevated several feet above the surrounding areas. Cart path 'A' is located adjacent to resource areas such as Fall Brook, bordering vegetated wetland areas, and cranberry bogs for the majority of its length. Along portions of its route, it runs adjacent to the western bank of Fall Brook and crosses an unnamed stream and its bordering vegetated wetlands. Cart path 'D' runs along a watercourse associated with Fall Brook. The width of the cart paths vary across the site but are typically measured to be between 16 feet and 24 feet wide and contain a commonly traveled path width of 12-18 feet wide. Installation of the electrical interconnection lines on utility poles and access of construction vehicles to Arrays A and C are only possible along Cart path 'A' and therefore by necessity must be within 25 feet of resource areas.

The riverfront area is demarcated as a parallel offset line 200 foot distant from the mean annual flood line of Fall Brook determined by the bank flagging placed by Wetlands Scientist-Botanist Kenneth Thomson. The

locations of the flagging were confirmed by Wetland Scientist Brook Monroe under a separate ANRAD filing reviewed by Environmental Partners Group Inc. The riverfront area on the site is extensive and contains in excess of 54.6 acres on Map 241, Lot 36, and in excess of 33.5 acres on Map 252, Lot 1 and Map 247, Lot 5. These figures are calculated solely by considering those portions of rivers and streams which were flagged as resource areas. No additional credit has been taken for the substantial additional riverfront area that exists onsite, but which was not delineated by Mr. Thomson. Portions of the work proposed within the riverfront area on site are limited to those previously discussed regarding site access, utility pole installation, and ancillary activities such as erosion control measure installation. In general, a 200-foot undisturbed buffer from the riverbank is provided for each panel array and ancillary features. Exceptions to the foregoing are described below.

The installation of approximately 6,000 linear feet of overhead electrical interconnection lines on utility poles is proposed within the riverfront area between Array 'C' and Chace Road and an additional 425 feet between Arrays 'A' & 'C'. Erosion control barriers in the form of staked silt fence will be installed along both sides of Cart Path 'A' for approximately 6,900 linear feet (6,450 feet in riverfront area) between Array 'C' and Chace Road. Additionally, this will be performed for the 850 foot (425 feet in riverfront area) interconnection and access route between Arrays 'A' and 'C'. These barriers will serve as the limit of project work. Portions of Cart path 'A' require minor repairs to fill in low spots where puddles form and to remove humps typically located on the lee sides of puddles. Following these repairs, a 6-inch layer of dense graded gravel be placed over a 16 foot width of Cart path 'A' for its entire project length to stabilize the road surface for construction traffic. Any roadway stabilization or regrading that occurs within the limits of the FEMA flood zone as delineated on the plan, shall be undertaken such that the final grade is equal to that of the existing grade in order to produce no adverse effects to the floodplain. This will include the removal of 6-inches of existing cart path soil (within the 16-foot width of stabilization) and replacement with 6-inches of dense graded gravel material to maintain existing grade. Soils scarified from the cart paths will be reused for grading within the array areas as needed. Disturbance of the soils is

considered to be de minimis for the utility pole installation auguring activities along this corridor and will occur within the confines of the erosion control barrier system along the cart paths. The erosion control barriers are to be placed two feet horizontally offset away from the 16-foot gravel roadway so that the limit of work is confined to a 20-foot width along the Cart Path 'A' corridor. The utility poles will be located within the two foot offset.

Since the project work within the Riverfront Area occurs entirely within the confines of the erosion control barrier systems installed along the existing cart path 'A', the total work area within the riverfront area is calculated by using the average width separating the erosion control barriers along Cart path 'A' (20 feet) multiplied by the combined length of the cart paths ($6,450 + 425 = 6,875$ feet). This results in approximately 3.2 acres of area which is $(3.2/(54.6+33.5))$ or approximately 3.6% of the delineated 88.1 acre riverfront area on site. The eastern bank of Fall Brook is grass covered and the western edge of the cart path features a mix of brush and small tree typically 4-25 feet tall. Therefore, actual new disturbance of the riverfront area associated with vegetation trimming or clearing work for the installation of the erosion control barriers is extremely minimal.

Tree clearing and stump grubbing is required to install Arrays 'A' & 'C'. The extent of the required tree clearing is shown on the site plan and clearing is intended to go up to the 25 foot resource area buffer (where site activities approach the resource areas). Due to the vast nature of the site, the closest tree clearing activities associated with the PV array installation will be approximately 1500 feet distant from the nearest occupied structure on abutting lands. Therefore, a natural vegetated buffer between the site and abutting houses will be maintained with the existing vegetation on the abutting lands. No night lighting is proposed as part of the project.

Perimeter gravel facility access roads constructed of dense graded gravel will be installed around Arrays A and C for maintenance and facility monitoring vehicle access and parking as shown on the plan. These 10 foot wide facility access roads will be installed within the limits of the 7-foot tall perimeter security fence and can be accessed only by authorized personnel

through locked gates. The perimeter fence shall have a gap of 6-inches beneath the fencing to allow for the passage of small animals beneath the fencing. Signage consistent with the Town of Freetown by-law identifying the owner of the facility and a 24-hour contact number shall be provided at each panel array access gate and locations of such are shown on the plan. No pavement (*bituminous concrete*) or concrete material will be used for access road construction.

There are no potential shading issues due to man made structures on the property. Potential shading areas are shown on the site development plan based upon a 48 degree angle of incidence at solar noon on the day of the spring/fall equinox and a 65 foot tree height which results in a 58-foot equinox shading offset.

In order to control and obviate erosion sediment transport and migration into the BVW during construction, a row of erosion control silt fence and/or rolls of hay bales or wattles sacks shall be placed and maintained along the limits of site work throughout the construction period and until final stabilization of disturbed surfaces has been achieved and until the Freetown Conservation Commission (FCC) issues a certificate of compliance for the site development. The erosion control measures in general are intended to be placed along the 25 foot resource area buffer zone where site activities approach resource areas.

The insitu soils were classified using the soils data as gleaned from the Natural Resource Conservation Service (NRCS) map unit for the locus. According to the NRCS map units for the locus, the insitu soils within all solar arrays across the site are predominantly composed of loamy sands with varying amounts of gravel and stones. The hydrologic soil group for soils underlying each proposed array is hydrologic soil group A. NRCS classifies soils in hydrologic groups, which measure runoff potential: soils that are classified as hydrologic group A soils are soils that are well drained, exhibiting high permeability value; soils that are classified as hydrologic group D soils are soils that are poorly drained, exhibiting very low permeability value.

On December 17-18, 2020 and December 21, 2020, the engineering representative of the applicant, Mr. Andrew Sargent, EIT, MA Soil evaluator, conducted soil evaluation and analysis at representative locations at the site where stormwater infiltration basins are proposed. A total of twenty six (26) soil evaluation/observation pits were excavated at the site. The locations of the observation pits and the elevation of high groundwater as determined by redoximorphic features and the soil logs are appended to the end of this narrative. The insitu soils data documented at the site in December 2020 largely corroborate the soils data as gleaned from the Natural Resource Conservation Service (NRCS) map unit for the locus. According to the NRCS map units for the locus, the insitu soils within PV Arrays are loamy sands. Observed soils within the tested locations were generally very consistent across the site and predominantly were loamy-clean fine to medium sands. Occasional test locations revealed soils containing very fine loamy sands, however the predominant soils to be found on site can be expected to be clean fine to medium sands. **The average hydrologic soil group for the site is confirmed to be 'A'.**

DEP stormwater management guidelines and standards require that post development rates of runoff be maintained at existing rates upon completion of a project under the 2, 10, and 100 year storm events; require treatment of runoff from paved areas prior to discharge; require recharge of runoff based on soil type.

While the current DEP stormwater policy requires solar panels to be treated as impervious areas for the purposes of groundwater recharge computations, it does not require incorporation of water quality treatment Best Management Practices (BMPs) into the design and management of stormwater at solar sites because solar panels are constructed of glass, and glass surfaces do not engender any runoff borne pollutants as would be expected from bituminous concrete surfaces. Therefore, no water treatment BMPs are proposed. In terms of rate of runoff control, the grass surfaces along the drip edges of the panels will intercept and infiltrate/recharge runoff from the panels. It should be remembered that the panels are elevated above the ground so that the impervious surface is not making any contact with the ground, as such, the existing ground surface will continue to have the same

runoff potential! However, in order to account for the increased volume of runoff that would be engendered by the glass panel table support posts, the impervious area in the stormwater modeling includes analysis of the impervious 4-inch diameter support posts.

Re-grading associated with the project will be minimized in order to maintain the natural flow of stormwater runoff towards the pre development wetland resource areas as much as practical. Each proposed PV array features grading designed to retain all of the precipitation that falls within the footprint of the post development array watershed. This is accomplished by either grading the site towards spacious depressions between 6 and 12 inches in depth within the footprint of the array or by constructing 2-3 foot wide earthen berms of 6-12 inch height around portions of the perimeter of the proposed PV arrays. This design provides temporary stormwater impoundment and infiltration of the stormwater occurs entirely within the footprint of the disturbed areas. Note that the depressions shown on the watershed plans are not the only locations where infiltration of stormwater will occur, since infiltration of stormwater will also occur across all portions of the PV arrays into the highly pervious soils. The depressed graded areas shown on the plan outlined in blue highlight the areas used in the stormwater modeling to demonstrate that the footprint of the proposed arrays can fully absorb the stormwater flows and volumes. Soil infiltration rates taken from the Rawls Table in the Massachusetts Stormwater Handbook indicate that sandy soils such as those found onsite have infiltration rates between 2.41 and 8.27 inches per hour. A conservative value of 2.41 inches per hour was utilized for all stormwater calculations.

A computer modeling software, HydroCad Stormwater Modeling System Version 10.00 developed by HydroCad Software Solutions LLC of Chocorua, New Hampshire was employed in the analyses to aid in the development of the runoff curve numbers; times of concentration; and the routing hydrographs for the sub-catchments. Under the post development conditions, stormwater runoff from the sub-catchments are captured within the perimeter of the arrays and are routed to the spacious shallow depression area(s). Precipitation was modeled using the higher and more conservative

Cornell precipitation estimates rather than those required by the MassDEP stormwater management standards.

In general, the stormwater management standards require a comparison is made between the routed hydrograph for discharge rates and volumes in the existing conditions state to the post development state. The rationale for this comparison is to document that the proposed site conditions do not cause stormwater to shed from the site in such a manner as to overwhelm downstream areas with flooding and additionally to promote recharge of existing groundwater levels at the site. Note that in the pre-developed condition, any rainfall excess would directly run off to the perimeter wetlands and that in the post development condition, any rainfall excess runs off to the low points within the arrays and is infiltrated solely within the limits of disturbance. It follows that even if flow rates and volumes to the infiltration areas were to be higher in the post condition state as compared to the pre-condition state due to the changes in ground coverage, they never actually leave the infiltration areas and the goals of the stormwater management standards have been satisfied. The results tabulated in Tables 1 and 2 are shown below.

Table 1
PRE- AND POST-DEVELOPMENT PEAK DISCHARGE RATES

Design Point	Pre-Development(cfs)			Post-Development(cfs)*		
	Design Storm			Design Storm		
	2-Year	10-Year	100-Year	2-Year	10-Year	100-Year
ARRAY A	0.00	0.05	3.74	0.00	0.00	0.00
ARRAY B	N/A	N/A	N/A	N/A	N/A	N/A
ARRAY C	0.00	0.02	3.08	0.00	0.00	0.00

* This represents the primary flow rate from each basin as indicated in the HydroCAD model. See the explanation in the subsequent paragraph regarding the derivation of the primary flow. Recall that all stormwater is infiltrated within the footprint of the modeled subcatchments and does not discharge off site or out of the subcatchment.

Table 2
PRE- AND POST-DEVELOPMENT VOLUMES OF RUNOFF

Design Point	Pre-Development(af)			Post-Development(af)**		
	Design Storm			Design Storm		
	2-Year	10-Year	100-Year	2-Year	10-Year	100-Year
ARRAY A	0.00	0.038	0.719	0.00	0.00	0.00
ARRAY B	N/A	N/A	N/A	N/A	N/A	N/A
ARRAY C	0.00	0.01	0.695	0.00	0.00	0.00

** Recall that all stormwater is infiltrated within the footprint of the modeled subcatchments and does not discharge off site or out of the subcatchment.

A hypothetical horizontal orifice is included within the stormwater modeling as the primary outflow from each modeled basin and is placed 0.01 feet immediately below the highest point of the modeled stormwater detention facility. The orifice is theoretically used to demonstrate that during all modeled storm events, in no scenario does water rises up to the horizontal plane of the theoretical orifice and therefore flows never pass through the orifice and depart the modeled stormwater storage areas. As expected, due to the highly permeable soils, the stormwater modeling indicates that the maximum depth of the impounded stormwater within each basin is seldom greater than 1- ½" for the 100 year storm event. In general, the entire volume of stormwater runoff infiltrates very quickly into the soil and is the

entire basin drains within one to three hours following the 100 year event. This high permeability of the sandy soils also allows the infiltrated stormwater to rapidly recharge the adjacent wetlands, rivers, and ponds. It also should be noted that the massive site is covered by vast areas of wetlands, cranberry bogs, surface water bodies, and river courses due to its low position within a depressed north-south oriented valley that receive the majority the flows from the east, west and south. These extensive water features provide a natural buffer to water level changes with their tremendous water storage capabilities. Notwithstanding this large hydraulic buffering capacity, the stormwater management for the proposed PV arrays is designed to reduce post condition runoff rates and volumes off site as compared to the pre condition state, by locally containing and infiltrating the runoff. The end result is that there will be no direct stormwater discharges to any resource areas and the project will not have any adverse effect to adjacent and/or downstream properties.

To the extent applicable, a DEP stormwater checklist has been prepared for the project and it is attached herewith, along with NRCS soils map and classification for the locus.

Test Pit Logs 1-26 December 2020
(off Chipaway Road Freetown, MA)
Assessors Map 252 Lot 1 & Map 247 Lot 5

TP-1

DEPTH	HORIZON	SOIL CLASS	COLOR	COMMENT
0-12"	FILL	M SAND	2.5Y 4/4	
12-24"	Ab &Bw	SANDY LOAM	10YR3/1 10YR5/3	
28-65"	C1	F SAND	2.5Y 6/2	MOTTLES@ 46" WEEPING @ 51"

GROUND SURFACE ELEVATION = 91.75'

HIGH GROUNDWATER ELEVATION =87.91'

TP-2

DEPTH	HORIZON	SOIL CLASS	COLOR	COMMENT
0-4"	Ap	LOAMY SAND	10YR3/2 10YR5/6	
4-72"	C1	F-M SAND	2.5Y 6/1	MOTTLES@ 48" WEeping @ 49"

GROUND SURFACE ELEVATION = 92.44'

HIGH GROUNDWATER ELEVATION =88.44'

TP-3

DEPTH	HORIZON	SOIL CLASS	COLOR	COMMENT
0-21"	Ap &Bw	LOAMY SAND	10YR3/2 10YR5/6	
21-80"	C1	M SAND	2.5Y 6/1	MOTTLES@ 68" WEeping @ 72"

GROUND SURFACE ELEVATION = 94.16'

HIGH GROUNDWATER ELEVATION =88.51'

TP-4

DEPTH	HORIZON	SOIL CLASS	COLOR	COMMENT
0-18"	Ap &Bw	LOAMY SAND	10YR3/2 10YR5/6	
18-72"	C1	F-M SAND	2.5Y 6/1	MOTTLES@ 33" WEeping @ 38"

GROUND SURFACE ELEVATION = 92.92'

HIGH GROUNDWATER ELEVATION =90.18'

TP-5

DEPTH	HORIZON	SOIL CLASS	COLOR	COMMENT
0-22"	Ap &Bw	LOAMY SAND	10YR3/2 10YR5/6	
22-72"	C1	F-M SAND	2.5Y 6/1	MOTTLES@ 43" WEeping @ 47"

GROUND SURFACE ELEVATION = 93.61'

HIGH GROUNDWATER ELEVATION =90.03'

TP-6

DEPTH	HORIZON	SOIL CLASS	COLOR	COMMENT
0-23"	Ap &Bw	LOAMY SAND	10YR3/2 10YR5/6	
23-80"	C1	F-M SAND	2.5Y 6/1	MOTTLES@ 35" WEeping @ 48"

GROUND SURFACE ELEVATION = 95.37'

HIGH GROUNDWATER ELEVATION =92.45'

TP-7

DEPTH	HORIZON	SOIL CLASS	COLOR	COMMENT
0-26"	Ap &Bw	LOAMY SAND	10YR3/2 10YR5/6	
26-80"	C1	F-M SAND	2.5Y 6/1	MOTTLES@ 44" WEeping @ 48"

GROUND SURFACE ELEVATION = 95.41'

HIGH GROUNDWATER ELEVATION =91.75'

TP-8

DEPTH	HORIZON	SOIL CLASS	COLOR	COMMENT
0-14"	Ap &Bw	LOAMY SAND	10YR3/2 10YR5/6	
14-75"	C1	M – C SAND	2.5Y 6/1	MOTTLES@ 32" WEeping @ 43"

GROUND SURFACE ELEVATION = 93.45'

HIGH GROUNDWATER ELEVATION =90.78'

TP-9

DEPTH	HORIZON	SOIL CLASS	COLOR	COMMENT
0-24"	Ap &Bw	LOAMY SAND	10YR3/2 10YR5/6	
24-88"	C1	M – SAND	2.5Y 6/1	MOTTLES@ 37" WEeping @ 43"

GROUND SURFACE ELEVATION = 94.96'

HIGH GROUNDWATER ELEVATION =91.86'

TP-10

DEPTH	HORIZON	SOIL CLASS	COLOR	COMMENT
0-19"	Ap &Bw	LOAMY SAND	10YR3/2 10YR5/6	
19-80"	C1	M – SAND	2.5Y 6/1	MOTTLES@ 46" WEeping @ 53"

GROUND SURFACE ELEVATION = 94.71'

HIGH GROUNDWATER ELEVATION =90.88'

TP-11

DEPTH	HORIZON	SOIL CLASS	COLOR	COMMENT
0-26"	Ap &Bw	LOAMY SAND	10YR3/2 10YR5/6	
26-84"	C1	F-M SAND	2.5Y 6/1	MOTTLES@ 50" WEeping @ 64"

GROUND SURFACE ELEVATION = 95.61'

HIGH GROUNDWATER ELEVATION =91.44'

TP-12

DEPTH	HORIZON	SOIL CLASS	COLOR	COMMENT
0-34"	Ap &Bw	LOAMY SAND	10YR3/2 10YR5/6	
34-84"	C1	F-M SAND	2.5Y 6/1	MOTTLES@ 43" WEeping @ 56"

GROUND SURFACE ELEVATION = 95.73'

HIGH GROUNDWATER ELEVATION =92.15'

TP-13

DEPTH	HORIZON	SOIL CLASS	COLOR	COMMENT
0-26"	Ap &Bw	LOAMY SAND	10YR3/2 10YR5/6	
26-80"	C1	F-M SAND	2.5Y 6/1	MOTTLES@ 39" WEeping @ 66"

GROUND SURFACE ELEVATION = 95.73'

HIGH GROUNDWATER ELEVATION =92.45'

TP-14

DEPTH	HORIZON	SOIL CLASS	COLOR	COMMENT
0-3"	Ap	LOAMY SAND	10YR3/2 10YR5/6	
3-80"	C1	M - SAND	2.5Y 6/1	MOTTLES@ 46" WEeping @ 56"

GROUND SURFACE ELEVATION = 93.92'

HIGH GROUNDWATER ELEVATION =90.09'

TP-15

DEPTH	HORIZON	SOIL CLASS	COLOR	COMMENT
0-17"	Ap &Bw	LOAMY SAND	10YR3/2 10YR5/6	
17-82"	C1	M - SAND	2.5Y 6/1	MOTTLES@ 39" WEeping @ 47"

GROUND SURFACE ELEVATION = 93.37'

HIGH GROUNDWATER ELEVATION =90.12'

TP-16

DEPTH	HORIZON	SOIL CLASS	COLOR	COMMENT
0-60"	C1	M-C SAND	2.5Y 4/4	10% GRAVEL MOTTLES@30" WEeping@ 32"

GROUND SURFACE ELEVATION = 94.60'

HIGH GROUNDWATER ELEVATION =92.10'

TP-17

DEPTH	HORIZON	SOIL CLASS	COLOR	COMMENT
0-21"	Ab &Bw	SANDY LOAM	10YR3/2 10YR5/6	
21-48"	C1	F-SANDY LOAM		MOTTLES@ 29"
48-84"	C2	GRAVELLY F-C SAND	2.5Y 6/1	WEEPING @ 60"

GROUND SURFACE ELEVATION = 95.86'

HIGH GROUNDWATER ELEVATION =93.44'

TP-18

DEPTH	HORIZON	SOIL CLASS	COLOR	COMMENT
0-14"	Ap &Bw	LOAMY SAND	10YR3/2 10YR5/6	
14-60"	C1	M-C SAND	2.5Y 6/1	MOTTLES@ 27" WEEPING @ 34"

GROUND SURFACE ELEVATION = 95.36'

HIGH GROUNDWATER ELEVATION =93.11'

TP-19

DEPTH	HORIZON	SOIL CLASS	COLOR	COMMENT
0-21"	Ap &Bw	LOAMY SAND	10YR3/2 10YR5/6	20% COBBLES AND BOULDERS
21-60"	C1	M-C SAND	2.5Y 6/1	MOTTLES@ 24" WEEPING @ 24"

GROUND SURFACE ELEVATION = 95.74'

HIGH GROUNDWATER ELEVATION =93.74'

TP-20

DEPTH	HORIZON	SOIL CLASS	COLOR	COMMENT
0-22"	Ap &Bw	LOAMY SAND	10YR3/2 10YR5/6	20% COBBLES AND BOULDERS
22-60"	C1	F-M SAND	2.5Y 6/1	MOTTLES@ 34" WEeping @ 39"

GROUND SURFACE ELEVATION = 95.11'

HIGH GROUNDWATER ELEVATION =92.28'

TP-21

DEPTH	HORIZON	SOIL CLASS	COLOR	COMMENT
0-20"	Ap &Bw	LOAMY SAND	10YR3/2 10YR5/6	
20-64"	C1	M-C SAND	2.5Y 6/1	MOTTLES@ 36" WEeping @ 39"

GROUND SURFACE ELEVATION = 95.03'

HIGH GROUNDWATER ELEVATION =92.03'

TP-22

DEPTH	HORIZON	SOIL CLASS	COLOR	COMMENT
0-18"	Ap &Bw	LOAMY SAND	10YR3/2 10YR5/6	
18-60"	C1	VERY FINE SAND	2.5Y 6/1	MOTTLES@ 47"
60-80"	C2	M- SAND	2.5Y 6/1	WEeping @ 72"

GROUND SURFACE ELEVATION = 95.86'

HIGH GROUNDWATER ELEVATION =91.94'

TP-23

DEPTH	HORIZON	SOIL CLASS	COLOR	COMMENT
0-4"	Ap	LOAMY SAND	10YR3/2 10YR5/6	
4-65"	C1	M - SAND	2.5Y 6/1	MOTTLES@ 34" WEeping @ 47"

GROUND SURFACE ELEVATION = 93.71'

HIGH GROUNDWATER ELEVATION =90.89'

TP-24

DEPTH	HORIZON	SOIL CLASS	COLOR	COMMENT
0-4"	Ap	LOAMY SAND	10YR3/2 10YR5/6	
4-64"	C1	M - SAND	2.5Y 6/1	MOTTLES@ 32" WEeping @ 41"

GROUND SURFACE ELEVATION = 92.70'

HIGH GROUNDWATER ELEVATION =90.03'

TP-25

DEPTH	HORIZON	SOIL CLASS	COLOR	COMMENT
0-4"	Ap	LOAMY SAND	10YR3/2 10YR5/6	
4-70"	C1	M - SAND	2.5Y 6/1	MOTTLES@ 33" WEeping @ 34"

GROUND SURFACE ELEVATION = 92.73'

HIGH GROUNDWATER ELEVATION =89.99'

TP-26

DEPTH	HORIZON	SOIL CLASS	COLOR	COMMENT
0-2"	Ap	LOAMY SAND	10YR3/2 10YR5/6	
2-72"	C1	M - SAND	2.5Y 6/1	MOTTLES@ 28" WEeping @ 37"

GROUND SURFACE ELEVATION = 92.86'

HIGH GROUNDWATER ELEVATION =90.53'

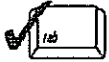
**Stormwater Checklist For Solar Farm
Off Chipaway Road (Map 247 Lot 5 & Map 252 Lot 1)
Freetown, MA**



Checklist for Stormwater Report

A. Introduction

Important:
When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



A Stormwater Report must be submitted with the Notice of Intent permit application to document compliance with the Stormwater Management Standards. The following checklist is NOT a substitute for the Stormwater Report (which should provide more substantive and detailed information) but is offered here as a tool to help the applicant organize their Stormwater Management documentation for their Report and for the reviewer to assess this information in a consistent format. As noted in the Checklist, the Stormwater Report must contain the engineering computations and supporting information set forth in Volume 3 of the Massachusetts Stormwater Handbook. The Stormwater Report must be prepared and certified by a Registered Professional Engineer (RPE) licensed in the Commonwealth.

The Stormwater Report must include:

- The Stormwater Checklist completed and stamped by a Registered Professional Engineer (see page 2) that certifies that the Stormwater Report contains all required submittals.¹ This Checklist is to be used as the cover for the completed Stormwater Report.
- Applicant/Project Name
- Project Address
- Name of Firm and Registered Professional Engineer that prepared the Report
- Long-Term Pollution Prevention Plan required by Standards 4-6
- Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan required by Standard 8²
- Operation and Maintenance Plan required by Standard 9

In addition to all plans and supporting information, the Stormwater Report must include a brief narrative describing stormwater management practices, including environmentally sensitive site design and LID techniques, along with a diagram depicting runoff through the proposed BMP treatment train. Plans are required to show existing and proposed conditions, identify all wetland resource areas, NRCS soil types, critical areas, Land Uses with Higher Potential Pollutant Loads (LUHPPL), and any areas on the site where infiltration rate is greater than 2.4 inches per hour. The Plans shall identify the drainage areas for both existing and proposed conditions at a scale that enables verification of supporting calculations.

As noted in the Checklist, the Stormwater Management Report shall document compliance with each of the Stormwater Management Standards as provided in the Massachusetts Stormwater Handbook. The soils evaluation and calculations shall be done using the methodologies set forth in Volume 3 of the Massachusetts Stormwater Handbook.

To ensure that the Stormwater Report is complete, applicants are required to fill in the Stormwater Report Checklist by checking the box to indicate that the specified information has been included in the Stormwater Report. If any of the information specified in the checklist has not been submitted, the applicant must provide an explanation. The completed Stormwater Report Checklist and Certification must be submitted with the Stormwater Report.

¹ The Stormwater Report may also include the Illicit Discharge Compliance Statement required by Standard 10. If not included in the Stormwater Report, the Illicit Discharge Compliance Statement must be submitted prior to the discharge of stormwater runoff to the post-construction best management practices.

² For some complex projects, it may not be possible to include the Construction Period Erosion and Sedimentation Control Plan in the Stormwater Report. In that event, the issuing authority has the discretion to issue an Order of Conditions that approves the project and includes a condition requiring the proponent to submit the Construction Period Erosion and Sedimentation Control Plan before commencing any land disturbance activity on the site.



Checklist for Stormwater Report

B. Stormwater Checklist and Certification

The following checklist is intended to serve as a guide for applicants as to the elements that ordinarily need to be addressed in a complete Stormwater Report. The checklist is also intended to provide conservation commissions and other reviewing authorities with a summary of the components necessary for a comprehensive Stormwater Report that addresses the ten Stormwater Standards.

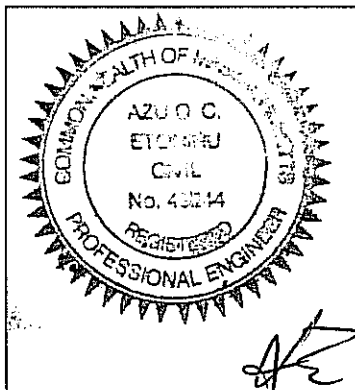
Note: Because stormwater requirements vary from project to project, it is possible that a complete Stormwater Report may not include information on some of the subjects specified in the Checklist. If it is determined that a specific item does not apply to the project under review, please note that the item is not applicable (N.A.) and provide the reasons for that determination.

A complete checklist must include the Certification set forth below signed by the Registered Professional Engineer who prepared the Stormwater Report.

Registered Professional Engineer's Certification

I have reviewed the Stormwater Report, including the soil evaluation, computations, Long-term Pollution Prevention Plan, the Construction Period Erosion and Sedimentation Control Plan (if included), the Long-term Post-Construction Operation and Maintenance Plan, the Illicit Discharge Compliance Statement (if included) and the plans showing the stormwater management system, and have determined that they have been prepared in accordance with the requirements of the Stormwater Management Standards as further elaborated by the Massachusetts Stormwater Handbook. I have also determined that the information presented in the Stormwater Checklist is accurate and that the information presented in the Stormwater Report accurately reflects conditions at the site as of the date of this permit application.

Registered Professional Engineer Block and Signature



[Handwritten Signature]
Signature and Date *AZUC ETONIRY*
PE # 45244
2/28/2022

Checklist

Project Type: Is the application for new development, redevelopment, or a mix of new and redevelopment?

- ☒ New development
☐ Redevelopment
☐ Mix of New Development and Redevelopment



Checklist for Stormwater Report

Checklist (continued)

LID Measures: Stormwater Standards require LID measures to be considered. Document what environmentally sensitive design and LID Techniques were considered during the planning and design of the project:

- ☒ No disturbance to any Wetland Resource Areas
- ☐ Site Design Practices (e.g. clustered development, reduced frontage setbacks)
- ☐ Reduced Impervious Area (Redevelopment Only)
- ☒ Minimizing disturbance to existing trees and shrubs
- ☐ LID Site Design Credit Requested:
 - ☐ Credit 1
 - ☐ Credit 2
 - ☐ Credit 3
- ☒ Use of "country drainage" versus curb and gutter conveyance and pipe
- ☐ Bioretention Cells (includes Rain Gardens)
- ☐ Constructed Stormwater Wetlands (includes Gravel Wetlands designs)
- ☐ Treebox Filter
- ☐ Water Quality Swale
- ☒ Grass Channel
- ☐ Green Roof
- ☐ Other (describe): _____

Standard 1: No New Untreated Discharges

- ☒ No new untreated discharges
- ☒ Outlets have been designed so there is no erosion or scour to wetlands and waters of the Commonwealth
- ☐ Supporting calculations specified in Volume 3 of the Massachusetts Stormwater Handbook included.



Checklist for Stormwater Report

Checklist (continued)

Standard 2: Peak Rate Attenuation

- ☐ Standard 2 waiver requested because the project is located in land subject to coastal storm flowage and stormwater discharge is to a wetland subject to coastal flooding.
- ☒ Evaluation provided to determine whether off-site flooding increases during the 100-year 24-hour storm.
- ☒ Calculations provided to show that post-development peak discharge rates do not exceed pre-development rates for the 2-year and 10-year 24-hour storms. If evaluation shows that off-site flooding increases during the 100-year 24-hour storm, calculations are also provided to show that post-development peak discharge rates do not exceed pre-development rates for the 100-year 24-hour storm.

Standard 3: Recharge

- ☒ Soil Analysis provided.
- ☒ Required Recharge Volume calculation provided.
- ☐ Required Recharge volume reduced through use of the LID site Design Credits.
- ☒ Sizing the infiltration, BMPs is based on the following method: Check the method used.
 - ☒ Static
 - ☐ Simple Dynamic
 - ☐ Dynamic Field¹
- ☒ Runoff from all impervious areas at the site discharging to the infiltration BMP.
- ☐ Runoff from all impervious areas at the site is *not* discharging to the infiltration BMP and calculations are provided showing that the drainage area contributing runoff to the infiltration BMPs is sufficient to generate the required recharge volume.
- ☒ Recharge BMPs have been sized to infiltrate the Required Recharge Volume.
- ☐ Recharge BMPs have been sized to infiltrate the Required Recharge Volume *only* to the maximum extent practicable for the following reason:
 - ☐ Site is comprised solely of C and D soils and/or bedrock at the land surface
 - ☐ M.G.L. c. 21E sites pursuant to 310 CMR 40.0000
 - ☐ Solid Waste Landfill pursuant to 310 CMR 19.000
 - ☐ Project is otherwise subject to Stormwater Management Standards only to the maximum extent practicable.
- ☒ Calculations showing that the infiltration BMPs will drain in 72 hours are provided.
- ☐ Property includes a M.G.L. c. 21E site or a solid waste landfill and a mounding analysis is included.

¹ 80% TSS removal is required prior to discharge to Infiltration BMP if Dynamic Field method is used.



Checklist for Stormwater Report

Checklist (continued)

Standard 3: Recharge (continued)

- ☐ The infiltration BMP is used to attenuate peak flows during storms greater than or equal to the 10-year 24-hour storm and separation to seasonal high groundwater is less than 4 feet and a mounding analysis is provided.
- ☒ Documentation is provided showing that infiltration BMPs do not adversely impact nearby wetland resource areas.

Standard 4: Water Quality

The Long-Term Pollution Prevention Plan typically includes the following:

- Good housekeeping practices;
 - Provisions for storing materials and waste products inside or under cover;
 - Vehicle washing controls;
 - Requirements for routine inspections and maintenance of stormwater BMPs;
 - Spill prevention and response plans;
 - Provisions for maintenance of lawns, gardens, and other landscaped areas;
 - Requirements for storage and use of fertilizers, herbicides, and pesticides;
 - Pet waste management provisions;
 - Provisions for operation and management of septic systems;
 - Provisions for solid waste management;
 - Snow disposal and plowing plans relative to Wetland Resource Areas;
 - Winter Road Salt and/or Sand Use and Storage restrictions;
 - Street sweeping schedules;
 - Provisions for prevention of illicit discharges to the stormwater management system;
 - Documentation that Stormwater BMPs are designed to provide for shutdown and containment in the event of a spill or discharges to or near critical areas or from LUHPPL;
 - Training for staff or personnel involved with implementing Long-Term Pollution Prevention Plan;
 - List of Emergency contacts for implementing Long-Term Pollution Prevention Plan.
- ☐ A Long-Term Pollution Prevention Plan is attached to Stormwater Report and is included as an attachment to the Wetlands Notice of Intent.
 - ☐ Treatment BMPs subject to the 44% TSS removal pretreatment requirement and the one inch rule for calculating the water quality volume are included, and discharge:
 - ☐ is within the Zone II or Interim Wellhead Protection Area
 - ☐ is near or to other critical areas
 - ☐ is within soils with a rapid infiltration rate (greater than 2.4 inches per hour)
 - ☐ involves runoff from land uses with higher potential pollutant loads.
 - ☐ The Required Water Quality Volume is reduced through use of the LID site Design Credits.
 - ☐ Calculations documenting that the treatment train meets the 80% TSS removal requirement and, if applicable, the 44% TSS removal pretreatment requirement, are provided.



Checklist for Stormwater Report

Checklist (continued)

Standard 4: Water Quality (continued)

- ☐ The BMP is sized (and calculations provided) based on:
 - ☐ The ½" or 1" Water Quality Volume or
 - ☐ The equivalent flow rate associated with the Water Quality Volume and documentation is provided showing that the BMP treats the required water quality volume.
- ☐ The applicant proposes to use proprietary BMPs, and documentation supporting use of proprietary BMP and proposed TSS removal rate is provided. This documentation may be in the form of the propriety BMP checklist found in Volume 2, Chapter 4 of the Massachusetts Stormwater Handbook and submitting copies of the TARP Report, STEP Report, and/or other third party studies verifying performance of the proprietary BMPs.
- ☐ A TMDL exists that indicates a need to reduce pollutants other than TSS and documentation showing that the BMPs selected are consistent with the TMDL is provided.

Standard 5: Land Uses With Higher Potential Pollutant Loads (LUHPPLs)

- ☐ The NPDES Multi-Sector General Permit covers the land use and the Stormwater Pollution Prevention Plan (SWPPP) has been included with the Stormwater Report.
- ☐ The NPDES Multi-Sector General Permit covers the land use and the SWPPP will be submitted **prior to** the discharge of stormwater to the post-construction stormwater BMPs.
- ☐ The NPDES Multi-Sector General Permit does **not** cover the land use.
- ☐ LUHPPLs are located at the site and industry specific source control and pollution prevention measures have been proposed to reduce or eliminate the exposure of LUHPPLs to rain, snow, snow melt and runoff, and been included in the long term Pollution Prevention Plan.
- ☐ All exposure has been eliminated.
- ☐ All exposure has **not** been eliminated and all BMPs selected are on MassDEP LUHPPL list.
- ☐ The LUHPPL has the potential to generate runoff with moderate to higher concentrations of oil and grease (e.g. all parking lots with >1000 vehicle trips per day) and the treatment train includes an oil grit separator, a filtering bioretention area, a sand filter or equivalent.

Standard 6: Critical Areas

- ☒ The discharge is near or to a critical area and the treatment train includes only BMPs that MassDEP has approved for stormwater discharges to or near that particular class of critical area.
- ☒ Critical areas and BMPs are identified in the Stormwater Report.



Checklist for Stormwater Report

Checklist (continued)

Standard 7: Redevelopments and Other Projects Subject to the Standards only to the maximum extent practicable

- ☐ The project is subject to the Stormwater Management Standards only to the maximum Extent Practicable as a:
 - ☐ Limited Project
 - ☐ Small Residential Projects: 5-9 single family houses or 5-9 units in a multi-family development provided there is no discharge that may potentially affect a critical area.
 - ☐ Small Residential Projects: 2-4 single family houses or 2-4 units in a multi-family development with a discharge to a critical area
 - ☐ Marina and/or boatyard provided the hull painting, service and maintenance areas are protected from exposure to rain, snow, snow melt and runoff
 - ☐ Bike Path and/or Foot Path
 - ☐ Redevelopment Project
 - ☐ Redevelopment portion of mix of new and redevelopment.
- ☐ Certain standards are not fully met (Standard No. 1, 8, 9, and 10 must always be fully met) and an explanation of why these standards are not met is contained in the Stormwater Report.
- ☐ The project involves redevelopment and a description of all measures that have been taken to improve existing conditions is provided in the Stormwater Report. The redevelopment checklist found in Volume 2 Chapter 3 of the Massachusetts Stormwater Handbook may be used to document that the proposed stormwater management system (a) complies with Standards 2, 3 and the pretreatment and structural BMP requirements of Standards 4-6 to the maximum extent practicable and (b) improves existing conditions.

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control

A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan must include the following information:

- Narrative;
 - Construction Period Operation and Maintenance Plan;
 - Names of Persons or Entity Responsible for Plan Compliance;
 - Construction Period Pollution Prevention Measures;
 - Erosion and Sedimentation Control Plan Drawings;
 - Detail drawings and specifications for erosion control BMPs, including sizing calculations;
 - Vegetation Planning;
 - Site Development Plan;
 - Construction Sequencing Plan;
 - Sequencing of Erosion and Sedimentation Controls;
 - Operation and Maintenance of Erosion and Sedimentation Controls;
 - Inspection Schedule;
 - Maintenance Schedule;
 - Inspection and Maintenance Log Form.
- ☒ A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan containing the information set forth above has been included in the Stormwater Report.



Checklist for Stormwater Report

Checklist (continued)

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control (continued)

- ☐ The project is highly complex and information is included in the Stormwater Report that explains why it is not possible to submit the Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan with the application. A Construction Period Pollution Prevention and Erosion and Sedimentation Control has **not** been included in the Stormwater Report but will be submitted **before** land disturbance begins.
- ☐ The project is **not** covered by a NPDES Construction General Permit.
- ☐ The project is covered by a NPDES Construction General Permit and a copy of the SWPPP is in the Stormwater Report.
- ☒ The project is covered by a NPDES Construction General Permit but no SWPPP been submitted. The SWPPP will be submitted BEFORE land disturbance begins.

Standard 9: Operation and Maintenance Plan

- ☒ The Post Construction Operation and Maintenance Plan is included in the Stormwater Report and includes the following information:
 - ☒ Name of the stormwater management system owners;
 - ☒ Party responsible for operation and maintenance;
 - ☒ Schedule for implementation of routine and non-routine maintenance tasks;
 - ☒ Plan showing the location of all stormwater BMPs maintenance access areas;
 - ☒ Description and delineation of public safety features;
 - ☒ Estimated operation and maintenance budget; and
 - ☒ Operation and Maintenance Log Form.
- ☐ The responsible party is **not** the owner of the parcel where the BMP is located and the Stormwater Report includes the following submissions:
 - ☐ A copy of the legal instrument (deed, homeowner's association, utility trust or other legal entity) that establishes the terms of and legal responsibility for the operation and maintenance of the project site stormwater BMPs;
 - ☐ A plan and easement deed that allows site access for the legal entity to operate and maintain BMP functions.

Standard 10: Prohibition of Illicit Discharges

- ☒ The Long-Term Pollution Prevention Plan includes measures to prevent illicit discharges;
- ☒ An Illicit Discharge Compliance Statement is attached;
- ☐ NO Illicit Discharge Compliance Statement is attached but will be submitted **prior to** the discharge of any stormwater to post-construction BMPs.

CHIPAWAY ROAD SOLAR FARM
OFF CHACE AND CHIPAWAY ROAD
FREETOWN, MA

REQUIRED STORMWATER
RECHARGE VOLUME VERIFICATION USING STATIC METHOD
AND DRAWDOWN ANALYSIS

THE IMPERVIOUS AREAS STATED BELOW ARE TAKEN TO BE THE SURFICIAL AREAS OF THE SOLAR PANEL TABLES (318.6 S.F. PER TABLE) RATHER THAN SIMPLY THE SOLAR SUPPORT POSTS SOLELY TO DEVELOP A REASONABLE RECHARGE VOLUME REQUIREMENT THAT OTHERWISE WOULD BE ABSENT CONSIDERING SUPPORT POSTS ALONE. STORAGE VOLUMES INDICATED BELOW INCLUDE ONLY THE AVAILABLE VOLUME FOR WATER STORAGE BETWEEN THE BASIN SURFACE AND THE LIP OF THE SURROUNDING BERM AND NO CREDIT IS TAKEN FOR THE VOLUME OF VOIDS BENEATH THE BASIN SURFACE WITHIN WHICH WATER INFILTRATE WOULD INTO THE SOIL.

PV ARRAY A – 510 PANEL TABLES (PT)

RECHARGE VOLUME VERIFICATION

REQUIRED RUNOFF VOLUME = NEW IMPERVIOUS AREA * TARGET DEPTH FACTOR

$$\begin{aligned} &= (510 \text{ PT}) * 318.6 \text{ S.F. / PT} + (1250 \text{ S.F. / EQUIP PAD}) \\ &= (164,986 \text{ SF.}) * (1 \text{ IN}) * (1 \text{ FT} / 12 \text{ IN}) \\ &= \underline{13,645 \text{ C.F.}} \end{aligned}$$

COMBINED AVAILABLE STORAGE VOLUME OF BASINS WITHIN ARRAY FOOTPRINT = 169,161 C.F. (SEE HYDROCAD ANALYSIS SHEET PGS. 60-64)

PROVIDED STORAGE VOLUME > REQUIRED RUNOFF VOLUME
(169,161 C.F. > 13,645 C.F.)

DRAWDOWN

DRAWDOWN TIME = REQUIRED RECHARGE VOLUME / (INFILTRATION RATE * COMBINED BASIN BOTTOM AREAS)

$$\begin{aligned} &= (13,645 \text{ C.F.} / (2.41 \text{ IN/HR} * (1 \text{ FT} / 12 \text{ IN}) * 132,487 \text{ S.F.}) \\ &= 0.04 \text{ HOURS} \\ &0.04 \text{ HOURS} < 72 \text{ HOURS} \end{aligned}$$

PV ARRAY C - 723 PANEL TABLES (PT)

RECHARGE VOLUME VERIFICATION

REQUIRED RUNOFF VOLUME = NEW IMPERVIOUS AREA * TARGET DEPTH
FACTOR

$$\begin{aligned} &= (723 \text{ PT}) * 318.6 \text{ S.F./PT} + 2*(1250 \text{ S.F./EQUIP PAD}) \\ &= (232,848 \text{ S.F.}) * (1 \text{ IN}) * (1\text{FT} / 12\text{IN}) \\ &= \underline{19,404 \text{ C.F.}} \end{aligned}$$

COMBINED AVAILABLE STORAGE VOLUME OF BASINS WITHIN ARRAY
FOOTPRINT = 204,723 C.F. (SEE HYDROCAD ANALYSIS SHEETS 66-70)

PROVIDED STORAGE VOLUME > REQUIRED RUNOFF VOLUME
(204,723 C.F. > 19,404 C.F.)

DRAWDOWN

DRAWDOWN TIME = REQUIRED RECHARGE VOLUME / (INFILTRATION
RATE *BOTTOM AREA)

$$\begin{aligned} &= (19,404 \text{ C.F.} / (2.41 \text{ IN/HR} * (1\text{FT} / 12\text{IN}) * 143,387 \text{ S.F.}) \\ &= 0.06 \text{ HOURS} \end{aligned}$$

$$0.06 \text{ HOURS} < 72 \text{ HOURS}$$

ANALYSIS OF THE HYDROCAD MODEL FOR ARRAYS A AND C
DEMONSTRATE THAT THE VOLUME OF WATER PONDED DURING THE 100
YEAR EVENT INFILTRATES INTO THE SOIL WITHIN 1-3 HOURS WITH THE
EXCEPTION OF BASIN A-3 WHICH TAKES 12 HOURS TO COMPLETELY
DRAIN- SEE ATTACHED HYDROCAD TABLES ON FOLLOWING PAGES
IT FOLLOWS THAT THE TIME TO COMPLETELY DRAIN THE BASINS
FOLLOWING THE 2 & 10 YEAR EVENTS WILL BE LOWER THAN THAT OF THE
100 YEAR EVENT

POST CONDITIONS CHIPAWAY

Type III 24-hr 100-Year Rainfall=8.52"

Prepared by E. T. ENGINEERING ENT., INC.

Printed 2/3/2022

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Hydrograph for Pond 1P: BASIN A1

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)
0.10	0.00	0	93.90	0.00	0.00	0.00
1.10	0.00	0	93.90	0.00	0.00	0.00
2.10	0.00	0	93.90	0.00	0.00	0.00
3.10	0.00	0	93.90	0.00	0.00	0.00
4.10	0.00	0	93.90	0.00	0.00	0.00
5.10	0.00	0	93.90	0.00	0.00	0.00
6.10	0.00	0	93.90	0.00	0.00	0.00
7.10	0.00	0	93.90	0.00	0.00	0.00
8.10	0.00	0	93.90	0.00	0.00	0.00
9.10	0.00	0	93.90	0.00	0.00	0.00
10.10	0.00	0	93.90	0.00	0.00	0.00
11.10	0.00	0	93.90	0.00	0.00	0.00
12.10	3.34	589	93.92	1.73	1.73	0.00
13.10	0.42	88	93.90	0.45	0.45	0.00
14.10	0.30	61	93.90	0.31	0.31	0.00
15.10	0.24	48	93.90	0.24	0.24	0.00
16.10	0.17	35	93.90	0.18	0.18	0.00
17.10	0.14	28	93.90	0.14	0.14	0.00
18.10	0.11	22	93.90	0.11	0.11	0.00
19.10	0.10	20	93.90	0.10	0.10	0.00
20.10	0.09	18	93.90	0.09	0.09	0.00
21.10	0.08	17	93.90	0.08	0.08	0.00
22.10	0.08	15	93.90	0.08	0.08	0.00
23.10	0.07	14	93.90	0.07	0.07	0.00
24.10	0.02	9	93.90	0.05	0.05	0.00
25.10	0.00	0	93.90	0.00	0.00	0.00
26.10	0.00	0	93.90	0.00	0.00	0.00
27.10	0.00	0	93.90	0.00	0.00	0.00
28.10	0.00	0	93.90	0.00	0.00	0.00
29.10	0.00	0	93.90	0.00	0.00	0.00
30.10	0.00	0	93.90	0.00	0.00	0.00
31.10	0.00	0	93.90	0.00	0.00	0.00
32.10	0.00	0	93.90	0.00	0.00	0.00
33.10	0.00	0	93.90	0.00	0.00	0.00
34.10	0.00	0	93.90	0.00	0.00	0.00
35.10	0.00	0	93.90	0.00	0.00	0.00

POST CONDITIONS CHIPAWAY

Type III 24-hr 100-Year Rainfall=8.52"

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Hydrograph for Pond 2P: BASIN A2

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)
0.10	0.00	0	92.40	0.00	0.00	0.00
1.10	0.00	0	92.40	0.00	0.00	0.00
2.10	0.00	0	92.40	0.00	0.00	0.00
3.10	0.00	0	92.40	0.00	0.00	0.00
4.10	0.00	0	92.40	0.00	0.00	0.00
5.10	0.00	0	92.40	0.00	0.00	0.00
6.10	0.00	0	92.40	0.00	0.00	0.00
7.10	0.00	0	92.40	0.00	0.00	0.00
8.10	0.00	0	92.40	0.00	0.00	0.00
9.10	0.00	0	92.40	0.00	0.00	0.00
10.10	0.00	0	92.40	0.00	0.00	0.00
11.10	0.00	0	92.40	0.00	0.00	0.00
12.10	7.78	1,086	92.41	4.35	4.35	0.00
13.10	1.93	3,909	92.45	4.39	4.39	0.00
14.10	1.33	268	92.40	1.36	1.36	0.00
15.10	1.06	211	92.40	1.07	1.07	0.00
16.10	0.77	155	92.40	0.79	0.79	0.00
17.10	0.63	125	92.40	0.63	0.63	0.00
18.10	0.49	98	92.40	0.50	0.50	0.00
19.10	0.44	87	92.40	0.44	0.44	0.00
20.10	0.40	79	92.40	0.40	0.40	0.00
21.10	0.37	73	92.40	0.37	0.37	0.00
22.10	0.34	67	92.40	0.34	0.34	0.00
23.10	0.31	60	92.40	0.31	0.31	0.00
24.10	0.23	51	92.40	0.26	0.26	0.00
25.10	0.00	0	92.40	0.00	0.00	0.00
26.10	0.00	0	92.40	0.00	0.00	0.00
27.10	0.00	0	92.40	0.00	0.00	0.00
28.10	0.00	0	92.40	0.00	0.00	0.00
29.10	0.00	0	92.40	0.00	0.00	0.00
30.10	0.00	0	92.40	0.00	0.00	0.00
31.10	0.00	0	92.40	0.00	0.00	0.00
32.10	0.00	0	92.40	0.00	0.00	0.00
33.10	0.00	0	92.40	0.00	0.00	0.00
34.10	0.00	0	92.40	0.00	0.00	0.00
35.10	0.00	0	92.40	0.00	0.00	0.00

POST CONDITIONS CHIPAWAY

Type III 24-hr 100-Year Rainfall=8.52"

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Hydrograph for Pond 3P: BASIN A3

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)
0.10	0.00	0	94.80	0.00	0.00	0.00
1.10	0.00	0	94.80	0.00	0.00	0.00
2.10	0.00	0	94.80	0.00	0.00	0.00
3.10	0.00	0	94.80	0.00	0.00	0.00
4.10	0.00	0	94.80	0.00	0.00	0.00
5.10	0.00	0	94.80	0.00	0.00	0.00
6.10	0.00	0	94.80	0.00	0.00	0.00
7.10	0.00	0	94.80	0.00	0.00	0.00
8.10	0.00	0	94.80	0.00	0.00	0.00
9.10	0.00	0	94.80	0.00	0.00	0.00
10.10	0.00	0	94.80	0.00	0.00	0.00
11.10	0.00	0	94.80	0.00	0.00	0.00
12.10	3.47	1,396	94.86	0.29	0.29	0.00
13.10	0.45	4,620	94.99	0.30	0.30	0.00
14.10	0.32	4,929	95.00	0.30	0.30	0.00
15.10	0.26	4,892	95.00	0.30	0.30	0.00
16.10	0.19	4,606	94.99	0.30	0.30	0.00
17.10	0.15	4,132	94.97	0.30	0.30	0.00
18.10	0.12	3,544	94.95	0.30	0.30	0.00
19.10	0.11	2,882	94.92	0.30	0.30	0.00
20.10	0.10	2,192	94.89	0.29	0.29	0.00
21.10	0.09	1,478	94.86	0.29	0.29	0.00
22.10	0.08	743	94.83	0.29	0.29	0.00
23.10	0.07	126	94.81	0.13	0.13	0.00
24.10	0.02	65	94.80	0.06	0.06	0.00
25.10	0.00	2	94.80	0.00	0.00	0.00
26.10	0.00	0	94.80	0.00	0.00	0.00
27.10	0.00	0	94.80	0.00	0.00	0.00
28.10	0.00	0	94.80	0.00	0.00	0.00
29.10	0.00	0	94.80	0.00	0.00	0.00
30.10	0.00	0	94.80	0.00	0.00	0.00
31.10	0.00	0	94.80	0.00	0.00	0.00
32.10	0.00	0	94.80	0.00	0.00	0.00
33.10	0.00	0	94.80	0.00	0.00	0.00
34.10	0.00	0	94.80	0.00	0.00	0.00
35.10	0.00	0	94.80	0.00	0.00	0.00

POST CONDITIONS CHIPAWAY

Type III 24-hr 100-Year Rainfall=8.52"

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Hydrograph for Pond 4P: BASIN C1

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)
0.10	0.00	0	92.50	0.00	0.00	0.00
1.10	0.00	0	92.50	0.00	0.00	0.00
2.10	0.00	0	92.50	0.00	0.00	0.00
3.10	0.00	0	92.50	0.00	0.00	0.00
4.10	0.00	0	92.50	0.00	0.00	0.00
5.10	0.00	0	92.50	0.00	0.00	0.00
6.10	0.00	0	92.50	0.00	0.00	0.00
7.10	0.00	0	92.50	0.00	0.00	0.00
8.10	0.00	0	92.50	0.00	0.00	0.00
9.10	0.00	0	92.50	0.00	0.00	0.00
10.10	0.00	0	92.50	0.00	0.00	0.00
11.10	0.00	0	92.50	0.00	0.00	0.00
12.10	6.77	1,412	92.54	1.86	1.86	0.00
13.10	1.07	4,520	92.63	1.91	1.91	0.00
14.10	0.77	1,032	92.53	1.86	1.86	0.00
15.10	0.62	135	92.50	0.63	0.63	0.00
16.10	0.45	98	92.50	0.46	0.46	0.00
17.10	0.37	80	92.50	0.37	0.37	0.00
18.10	0.29	62	92.50	0.29	0.29	0.00
19.10	0.26	56	92.50	0.26	0.26	0.00
20.10	0.24	51	92.50	0.24	0.24	0.00
21.10	0.22	47	92.50	0.22	0.22	0.00
22.10	0.20	43	92.50	0.20	0.20	0.00
23.10	0.18	39	92.50	0.18	0.18	0.00
24.10	0.08	29	92.50	0.13	0.13	0.00
25.10	0.00	0	92.50	0.00	0.00	0.00
26.10	0.00	0	92.50	0.00	0.00	0.00
27.10	0.00	0	92.50	0.00	0.00	0.00
28.10	0.00	0	92.50	0.00	0.00	0.00
29.10	0.00	0	92.50	0.00	0.00	0.00
30.10	0.00	0	92.50	0.00	0.00	0.00
31.10	0.00	0	92.50	0.00	0.00	0.00
32.10	0.00	0	92.50	0.00	0.00	0.00
33.10	0.00	0	92.50	0.00	0.00	0.00
34.10	0.00	0	92.50	0.00	0.00	0.00
35.10	0.00	0	92.50	0.00	0.00	0.00

POST CONDITIONS CHIPAWAY

Type III 24-hr 100-Year Rainfall=8.52"

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Hydrograph for Pond 5P: BASIN C2

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)
0.10	0.00	0	95.80	0.00	0.00	0.00
1.10	0.00	0	95.80	0.00	0.00	0.00
2.10	0.00	0	95.80	0.00	0.00	0.00
3.10	0.00	0	95.80	0.00	0.00	0.00
4.10	0.00	0	95.80	0.00	0.00	0.00
5.10	0.00	0	95.80	0.00	0.00	0.00
6.10	0.00	0	95.80	0.00	0.00	0.00
7.10	0.00	0	95.80	0.00	0.00	0.00
8.10	0.00	0	95.80	0.00	0.00	0.00
9.10	0.00	0	95.80	0.00	0.00	0.00
10.10	0.00	0	95.80	0.00	0.00	0.00
11.10	0.00	0	95.80	0.00	0.00	0.00
12.10	7.26	1,476	95.83	2.65	2.65	0.00
13.10	1.05	1,442	95.83	2.65	2.65	0.00
14.10	0.76	167	95.80	0.78	0.78	0.00
15.10	0.61	133	95.80	0.62	0.62	0.00
16.10	0.44	97	95.80	0.45	0.45	0.00
17.10	0.36	79	95.80	0.37	0.37	0.00
18.10	0.28	62	95.80	0.29	0.29	0.00
19.10	0.26	56	95.80	0.26	0.26	0.00
20.10	0.24	51	95.80	0.24	0.24	0.00
21.10	0.22	47	95.80	0.22	0.22	0.00
22.10	0.20	43	95.80	0.20	0.20	0.00
23.10	0.18	39	95.80	0.18	0.18	0.00
24.10	0.06	26	95.80	0.12	0.12	0.00
25.10	0.00	0	95.80	0.00	0.00	0.00
26.10	0.00	0	95.80	0.00	0.00	0.00
27.10	0.00	0	95.80	0.00	0.00	0.00
28.10	0.00	0	95.80	0.00	0.00	0.00
29.10	0.00	0	95.80	0.00	0.00	0.00
30.10	0.00	0	95.80	0.00	0.00	0.00
31.10	0.00	0	95.80	0.00	0.00	0.00
32.10	0.00	0	95.80	0.00	0.00	0.00
33.10	0.00	0	95.80	0.00	0.00	0.00
34.10	0.00	0	95.80	0.00	0.00	0.00
35.10	0.00	0	95.80	0.00	0.00	0.00

POST CONDITIONS CHIPAWAY

Type III 24-hr 100-Year Rainfall=8.52"

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Hydrograph for Pond 6P: BASIN C3

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)
0.10	0.00	0	94.80	0.00	0.00	0.00
1.10	0.00	0	94.80	0.00	0.00	0.00
2.10	0.00	0	94.80	0.00	0.00	0.00
3.10	0.00	0	94.80	0.00	0.00	0.00
4.10	0.00	0	94.80	0.00	0.00	0.00
5.10	0.00	0	94.80	0.00	0.00	0.00
6.10	0.00	0	94.80	0.00	0.00	0.00
7.10	0.00	0	94.80	0.00	0.00	0.00
8.10	0.00	0	94.80	0.00	0.00	0.00
9.10	0.00	0	94.80	0.00	0.00	0.00
10.10	0.00	0	94.80	0.00	0.00	0.00
11.10	0.00	0	94.80	0.00	0.00	0.00
12.10	7.62	1,303	94.82	3.56	3.56	0.00
13.10	1.16	269	94.80	1.25	1.25	0.00
14.10	0.84	185	94.80	0.86	0.86	0.00
15.10	0.68	148	94.80	0.69	0.69	0.00
16.10	0.49	107	94.80	0.50	0.50	0.00
17.10	0.40	88	94.80	0.41	0.41	0.00
18.10	0.32	69	94.80	0.32	0.32	0.00
19.10	0.29	62	94.80	0.29	0.29	0.00
20.10	0.26	57	94.80	0.26	0.26	0.00
21.10	0.24	52	94.80	0.24	0.24	0.00
22.10	0.22	48	94.80	0.22	0.22	0.00
23.10	0.20	43	94.80	0.20	0.20	0.00
24.10	0.07	29	94.80	0.14	0.14	0.00
25.10	0.00	0	94.80	0.00	0.00	0.00
26.10	0.00	0	94.80	0.00	0.00	0.00
27.10	0.00	0	94.80	0.00	0.00	0.00
28.10	0.00	0	94.80	0.00	0.00	0.00
29.10	0.00	0	94.80	0.00	0.00	0.00
30.10	0.00	0	94.80	0.00	0.00	0.00
31.10	0.00	0	94.80	0.00	0.00	0.00
32.10	0.00	0	94.80	0.00	0.00	0.00
33.10	0.00	0	94.80	0.00	0.00	0.00
34.10	0.00	0	94.80	0.00	0.00	0.00
35.10	0.00	0	94.80	0.00	0.00	0.00

STORMWATER SYSTEM OPERATION AND MAINTENANCE PROGRAM

Chipaway Road Solar

(Assessor's Map 247, Lot 5 & Map 252 Lot 1)

Freetown, MA

February 2021; Revised February 2022

The current landowner of the project site is Chipaway Corporation. The owner of the proposed stormwater management system will be Just Solar LLC., following the approval of the Site Plans by the Freetown Planning Board and Conservation Commission. Just Solar LLC., or its successor in interest will be responsible for the ongoing operation and maintenance of the stormwater management system until such time the solar facility is leased or sold, or otherwise decommissioned following its useful life. The responsibility of the operator of the solar facility for the operation and maintenance of the stormwater management system shall be listed within a deed or lease agreement and shall be recorded in the Bristol County Registry (Fall River).

Access to the solar arrays will be via locked gates that only authorized personnel have control of.

The site drainage system consists of multiple spacious depressions within each array that provide temporary storage for stormwater flows until the highly permeable sandy soils infiltrate the entire volume. In addition, along portions of the perimeter of the arrays, the proposed grading includes shallow 6-inch gravel roadway to prevent runoff from flowing directly out of the arrays and to direct the stormwater towards the depression areas. In order to ensure future and on-going proper and adequate functioning of the drainage system for the Off Chipaway Road Solar project, the owner shall at a minimum institute the following maintenance program:

Between March 1st and October 30th, the perimeter gravel roadways shall be monitored for evidence of erosion, and the grassed depressions shall be checked for erosion, sedimentation, and appropriate vegetative coverage. An inspection should be performed quarterly and preferably within the months of April, June, and September. Any eroded soils shall be replaced and stabilized with adequate grass mix planted over a 4 to 6-inch clean loam. Any build up of sediments within the depressions shall be removed using hand techniques. Mowing or weed-whacking will only be allowed between November 1st and March 1st to allow wildlife to utilize the grassland habitat. These activities would ideally be conducted in November or December once all the leaves have fallen from the trees and before the onset of winter conditions and snow cover. During this time, excess vegetation growth shall be removed to ensure that the grass surface of the berms has not sustained damage from erosion. Fallen leaves within the depressions shall be hand raked and removed from the area in order to ensure successful operation of the planted grass mix.

STORMWATER SYSTEM OPERATION AND MAINTENANCE PROGRAM

Chipaway Road Solar

Off Chipaway Road

(Assessor's Map 247 Lot 5 & Map 252 Lot 1)

Freetown, MA

February 2021; Revised February 2022

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Illicit Discharge Statement

No illicit discharge (including sanitary wastewater, oil, grease, etc.) shall be dumped onsite. The owner/operator of the facility shall maintain an active log for the maintenance of the drainage system. The log shall be subject to random review by the Town of Freetown for compliance verification. The log shall include the date of inspection and action undertaken as a maintenance action and the name and signature of the person who conducted the inspection and maintenance. Any accidental discharge of reportable quantity of oil or hazardous material at the site must be cleaned up pursuant to MGL Ch. 21E, as amended and 310 CMR 40 (the Massachusetts Contingency Plan). The operation and maintenance requirement for this facility shall be on-going.

The maintenance log shall include the name, address and phone number of the person responsible for the maintenance and operation of the stormwater system and shall be duly executed and signed by the responsible person and submitted to the Planning Board for its review, approval and record prior to any activation of the overall system.

The annual operations and maintenance budget is expected to be \$12,500 annually.

POST-CONSTRUCTION
STORMWATER SYSTEM OPERATION
SEMI-ANNUAL INSPECTION LOG

OWNER: JUST SOLAR LLC.

LOCATION : OFF CHIPAWAY ROAD

DATE : _____

SYSTEM COMPONENT	OBSERVED CONDITIONS	RECOMMENDED ACTION	INSPECTOR'S NAME

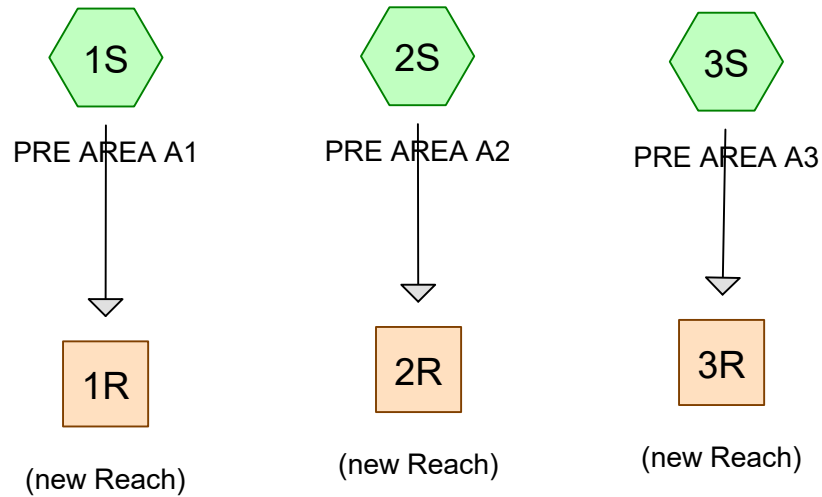
I HEREBY CERTIFY UNDER THE PENALTY AND PAINS OF PERJURY THAT
THE ABOVE STATEMENTS AND INSPECTION WERE MADE BY ME AND ARE
ACCURATE, TO THE BEST OF MY KNOWLEDGE.

INSPECTOR'S SIGNATURE

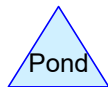
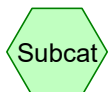
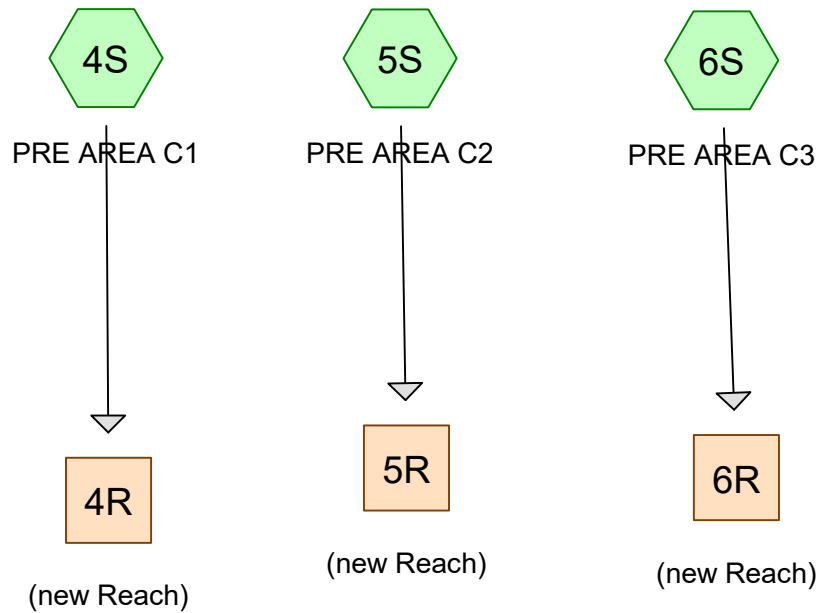
DATE

**Existing Conditions Analysis Data For Solar Farm
Off Chipaway Road (Map 247 Lot 5 & Map 252 Lot 1)
Freetown, MA**

PV ARRAY AREA "A"



PV ARRAY AREA "C"



Routing Diagram for PRE CONDITIONS CHIPAWAY

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PRE CONDITIONS CHIPAWAY

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Rainfall Events Listing

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2-Year	Type III 24-hr		Default	24.00	1	3.31	2
2	10-Year	Type III 24-hr		Default	24.00	1	4.88	2
3	100-Year	Type III 24-hr		Default	24.00	1	8.52	2

PRE CONDITIONS CHIPAWAY

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Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
4.110	39	>75% Grass cover, Good, HSG A (1S, 2S, 3S)
0.397	72	Dirt roads, HSG A (4S, 5S, 6S)
18.750	30	Woods, Good, HSG A (1S, 2S, 3S, 4S, 5S, 6S)
23.256	32	TOTAL AREA

PRE CONDITIONS CHIPAWAY

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Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
23.256	HSG A	1S, 2S, 3S, 4S, 5S, 6S
0.000	HSG B	
0.000	HSG C	
0.000	HSG D	
0.000	Other	
23.256		TOTAL AREA

PRE CONDITIONS CHIPAWAY

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Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
4.110	0.000	0.000	0.000	0.000	4.110	>75% Grass cover, Good	1S, 2S, 3S
0.397	0.000	0.000	0.000	0.000	0.397	Dirt roads	4S, 5S, 6S
18.750	0.000	0.000	0.000	0.000	18.750	Woods, Good	1S, 2S, 3S, 4S, 5S, 6S
23.256	0.000	0.000	0.000	0.000	23.256	TOTAL AREA	

PRE CONDITIONS CHIPAWAY*Type III 24-hr 2-Year Rainfall=3.31"*

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Time span=0.10-30.00 hrs, dt=0.05 hrs, 599 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: PRE AREA A1	Runoff Area=62,707 sf 0.00% Impervious Runoff Depth=0.00" Flow Length=89' Tc=7.9 min CN=31 Runoff=0.00 cfs 0.000 af
Subcatchment 2S: PRE AREA A2	Runoff Area=299,064 sf 0.00% Impervious Runoff Depth=0.00" Flow Length=434' Tc=21.7 min CN=34 Runoff=0.00 cfs 0.000 af
Subcatchment 3S: PRE AREA A3	Runoff Area=70,068 sf 0.00% Impervious Runoff Depth=0.00" Flow Length=148' Tc=13.0 min CN=35 Runoff=0.00 cfs 0.000 af
Subcatchment 4S: PRE AREA C1	Runoff Area=184,766 sf 0.00% Impervious Runoff Depth=0.00" Flow Length=245' Tc=15.2 min CN=31 Runoff=0.00 cfs 0.000 af
Subcatchment 5S: PRE AREA C2	Runoff Area=183,945 sf 0.00% Impervious Runoff Depth=0.00" Flow Length=131' Slope=0.0060 '/' Tc=14.0 min CN=32 Runoff=0.00 cfs 0.000 af
Subcatchment 6S: PRE AREA C3	Runoff Area=212,498 sf 0.00% Impervious Runoff Depth=0.00" Flow Length=238' Tc=7.1 min CN=30 Runoff=0.00 cfs 0.000 af
Reach 1R: (new Reach)	Inflow=0.00 cfs 0.000 af Outflow=0.00 cfs 0.000 af
Reach 2R: (new Reach)	Inflow=0.00 cfs 0.000 af Outflow=0.00 cfs 0.000 af
Reach 3R: (new Reach)	Inflow=0.00 cfs 0.000 af Outflow=0.00 cfs 0.000 af
Reach 4R: (new Reach)	Inflow=0.00 cfs 0.000 af Outflow=0.00 cfs 0.000 af
Reach 5R: (new Reach)	Inflow=0.00 cfs 0.000 af Outflow=0.00 cfs 0.000 af
Reach 6R: (new Reach)	Inflow=0.00 cfs 0.000 af Outflow=0.00 cfs 0.000 af

Total Runoff Area = 23.256 ac Runoff Volume = 0.000 af Average Runoff Depth = 0.00"
100.00% Pervious = 23.256 ac 0.00% Impervious = 0.000 ac

PRE CONDITIONS CHIPAWAY

Type III 24-hr 2-Year Rainfall=3.31"

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Summary for Subcatchment 1S: PRE AREA A1

IMPERVIOUS AREA PER PANEL TABLE IS 0.698 S.F.

52 PANEL TABLES X 0.698 = 36.3 S.F.

[45] Hint: Runoff=Zero

Runoff = 0.00 cfs @ 0.10 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.10-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.31"

Area (sf)	CN	Description
53,603	30	Woods, Good, HSG A
9,104	39	>75% Grass cover, Good, HSG A
62,707	31	Weighted Average
62,707		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0	35	0.0050	0.08		Sheet Flow, Grass: Short n= 0.150 P2= 3.50"
0.6	26	0.0100	0.70		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.3	28	0.0500	1.57		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
7.9	89	Total			

PRE CONDITIONS CHIPAWAY

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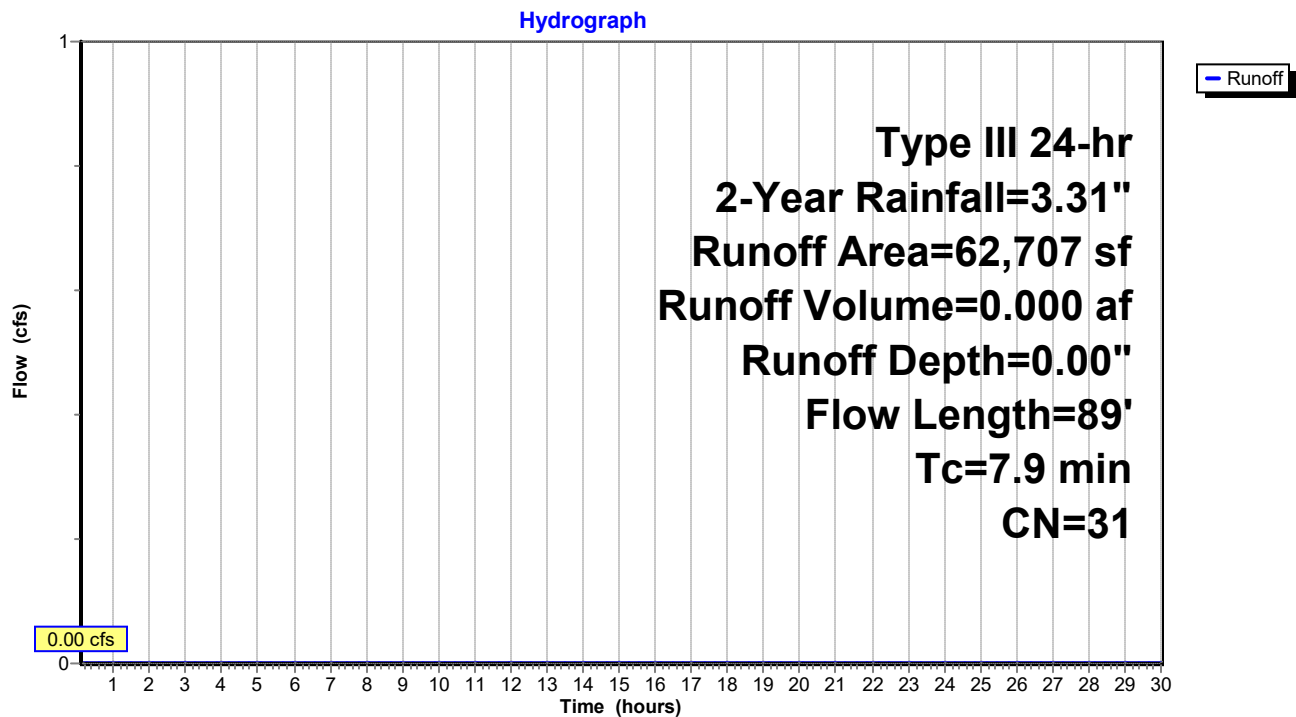
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Type III 24-hr 2-Year Rainfall=3.31"

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Subcatchment 1S: PRE AREA A1



PRE CONDITIONS CHIPAWAY

Type III 24-hr 2-Year Rainfall=3.31"

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Summary for Subcatchment 2S: PRE AREA A2

IMPERVIOUS AREA PER PANEL TABLE IS 0.698 S.F.

52 PANEL TABLES X 0.698 = 36.3 S.F.

[45] Hint: Runoff=Zero

Runoff = 0.00 cfs @ 0.10 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.10-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.31"

Area (sf)	CN	Description
170,171	30	Woods, Good, HSG A
128,893	39	>75% Grass cover, Good, HSG A
299,064	34	Weighted Average
299,064		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.5	25	0.0080	0.09		Sheet Flow, Grass: Short n= 0.150 P2= 3.50"
2.6	98	0.0080	0.63		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
12.4	236	0.0040	0.32		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
2.2	75	0.0130	0.57		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
21.7	434	Total			

PRE CONDITIONS CHIPAWAY

Prepared by E. T. ENGINEERING ENT., INC.

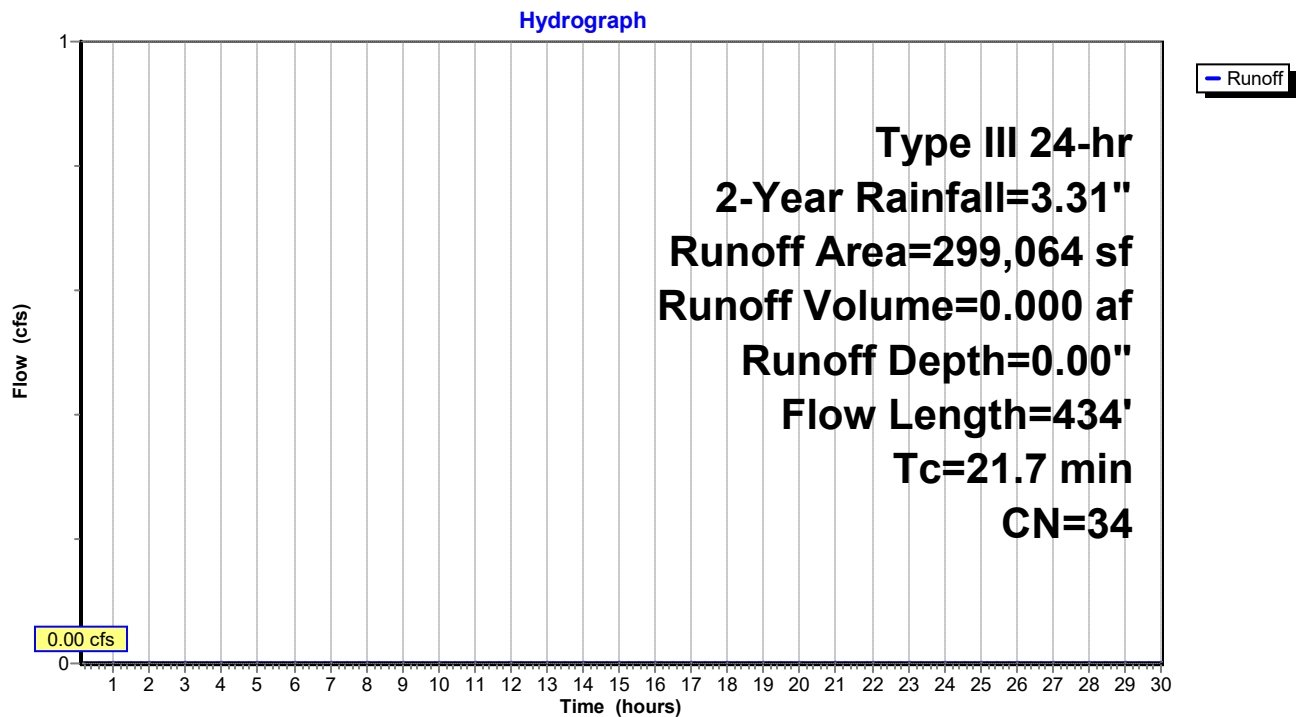
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Type III 24-hr 2-Year Rainfall=3.31"

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Subcatchment 2S: PRE AREA A2



PRE CONDITIONS CHIPAWAY

Type III 24-hr 2-Year Rainfall=3.31"

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Summary for Subcatchment 3S: PRE AREA A3

IMPERVIOUS AREA PER PANEL TABLE IS 0.698 S.F.

52 PANEL TABLES X 0.698 = 36.3 S.F.

[45] Hint: Runoff=Zero

Runoff = 0.00 cfs @ 0.10 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.10-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.31"

Area (sf)	CN	Description
29,051	30	Woods, Good, HSG A
41,017	39	>75% Grass cover, Good, HSG A
70,068	35	Weighted Average
70,068		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.6	25	0.0110	0.05		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.50"
1.7	55	0.0110	0.52		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
2.7	68	0.0070	0.42		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
13.0	148	Total			

PRE CONDITIONS CHIPAWAY

Prepared by E. T. ENGINEERING ENT., INC.

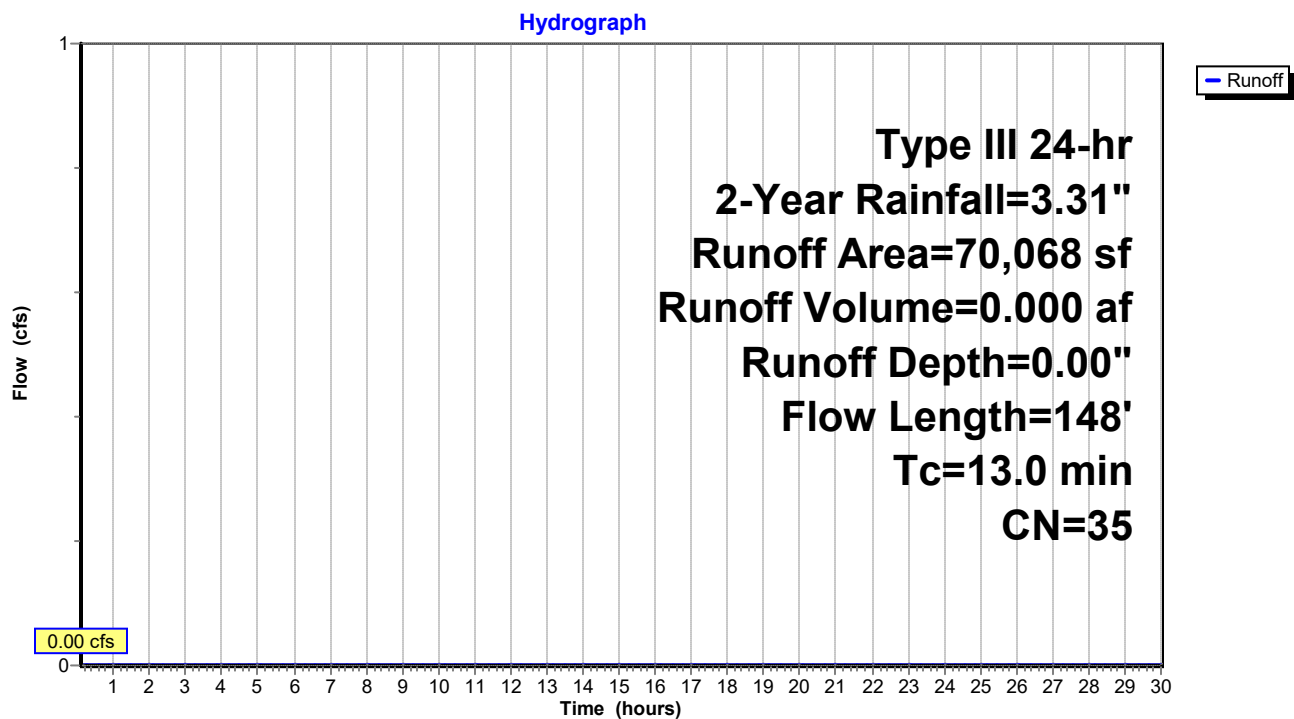
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Type III 24-hr 2-Year Rainfall=3.31"

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Subcatchment 3S: PRE AREA A3



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Type III 24-hr 2-Year Rainfall=3.31"

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Summary for Subcatchment 4S: PRE AREA C1

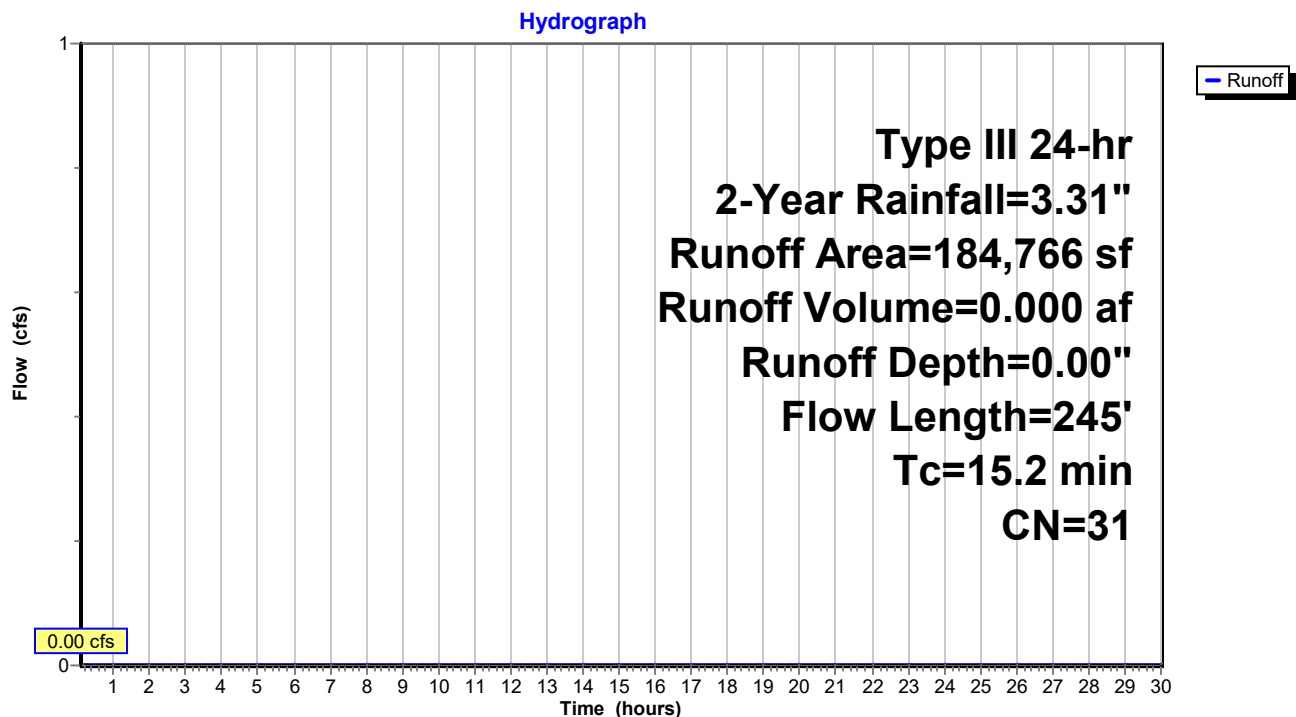
[45] Hint: Runoff=Zero

Runoff = 0.00 cfs @ 0.10 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.10-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.31"

Area (sf)	CN	Description
178,266	30	Woods, Good, HSG A
6,500	72	Dirt roads, HSG A
184,766	31	Weighted Average
184,766		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.9	20	0.0050	0.03		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.50"
5.3	225	0.0200	0.71		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
15.2	245	Total			

Subcatchment 4S: PRE AREA C1

PRE CONDITIONS CHIPAWAY

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Type III 24-hr 2-Year Rainfall=3.31"

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Summary for Subcatchment 5S: PRE AREA C2

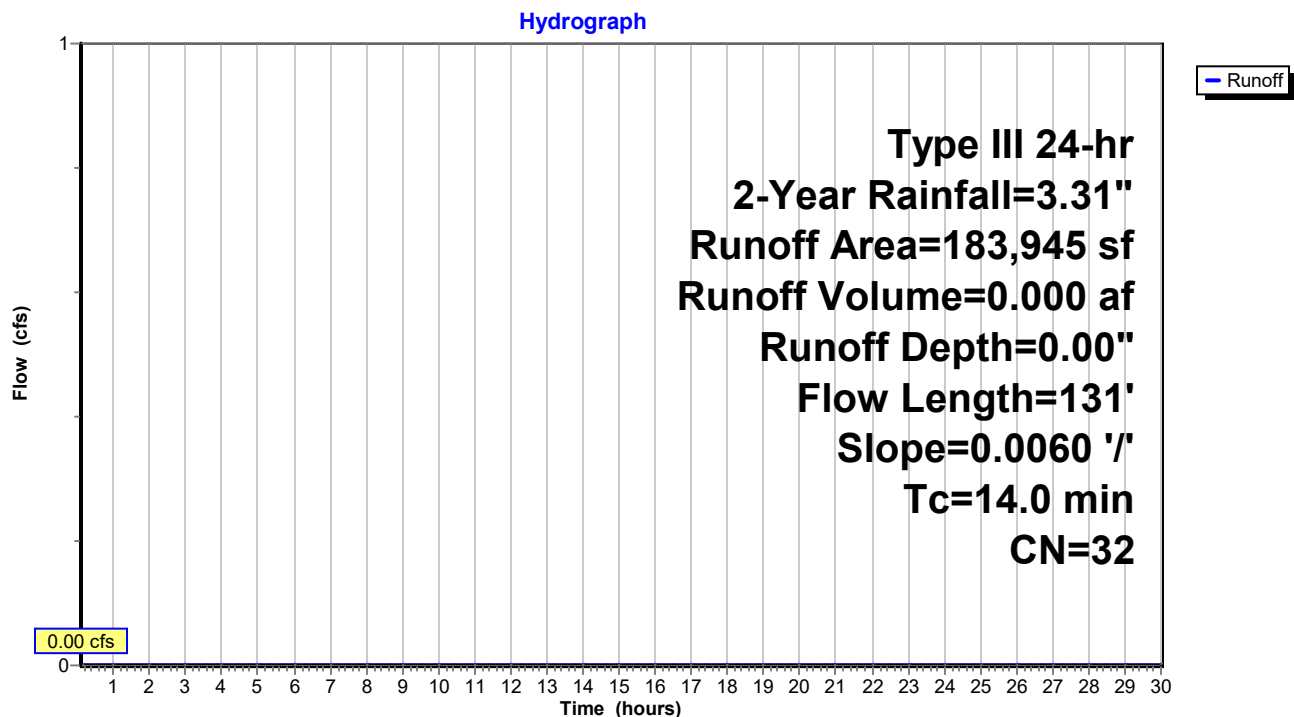
[45] Hint: Runoff=Zero

Runoff = 0.00 cfs @ 0.10 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.10-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.31"

Area (sf)	CN	Description
175,545	30	Woods, Good, HSG A
8,400	72	Dirt roads, HSG A
183,945	32	Weighted Average
183,945		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.2	20	0.0060	0.04		Sheet Flow,
					Woods: Light underbrush n= 0.400 P2= 3.50"
4.8	111	0.0060	0.39		Shallow Concentrated Flow,
					Woodland Kv= 5.0 fps
14.0	131	Total			

Subcatchment 5S: PRE AREA C2

PRE CONDITIONS CHIPAWAY

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Type III 24-hr 2-Year Rainfall=3.31"

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Summary for Subcatchment 6S: PRE AREA C3

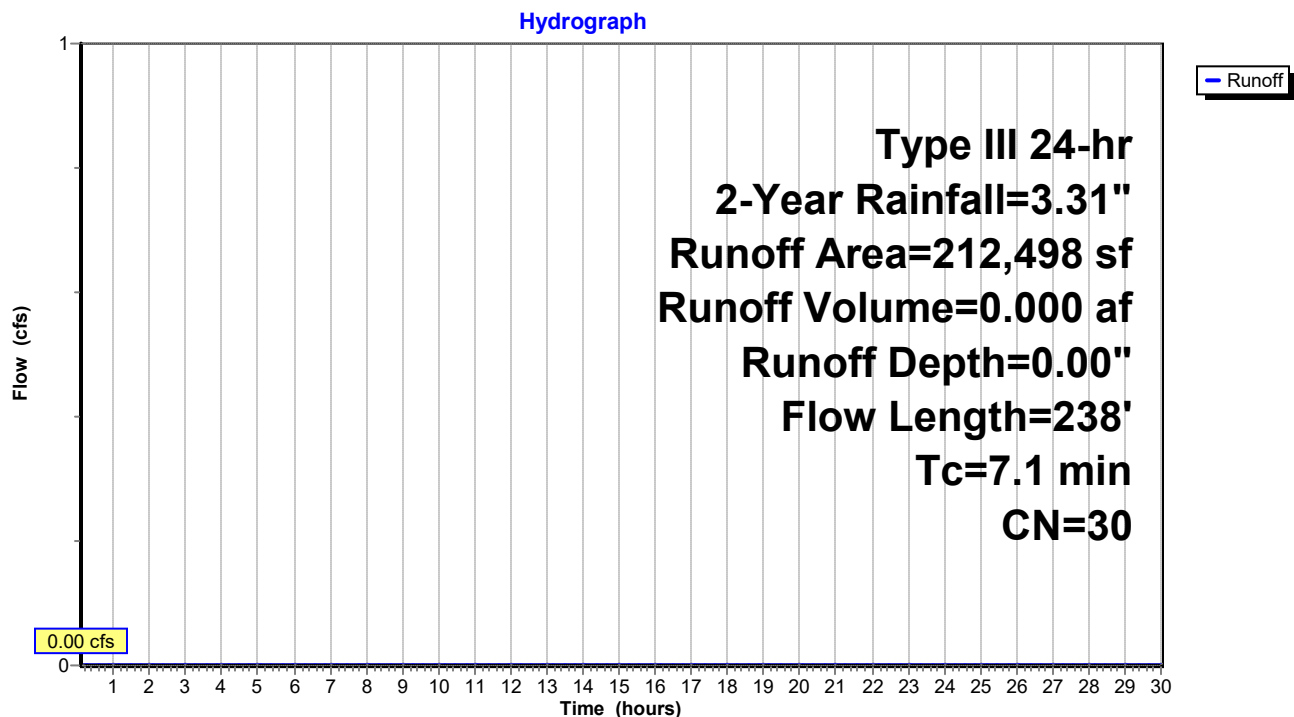
[45] Hint: Runoff=Zero

Runoff = 0.00 cfs @ 0.10 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.10-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.31"

Area (sf)	CN	Description
210,108	30	Woods, Good, HSG A
2,390	72	Dirt roads, HSG A
212,498	30	Weighted Average
212,498		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.5	20	0.0220	0.06		Sheet Flow,
					Woods: Light underbrush n= 0.400 P2= 3.50"
1.6	218	0.2100	2.29		Shallow Concentrated Flow,
					Woodland Kv= 5.0 fps
7.1	238	Total			

Subcatchment 6S: PRE AREA C3

PRE CONDITIONS CHIPAWAY

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Type III 24-hr 2-Year Rainfall=3.31"

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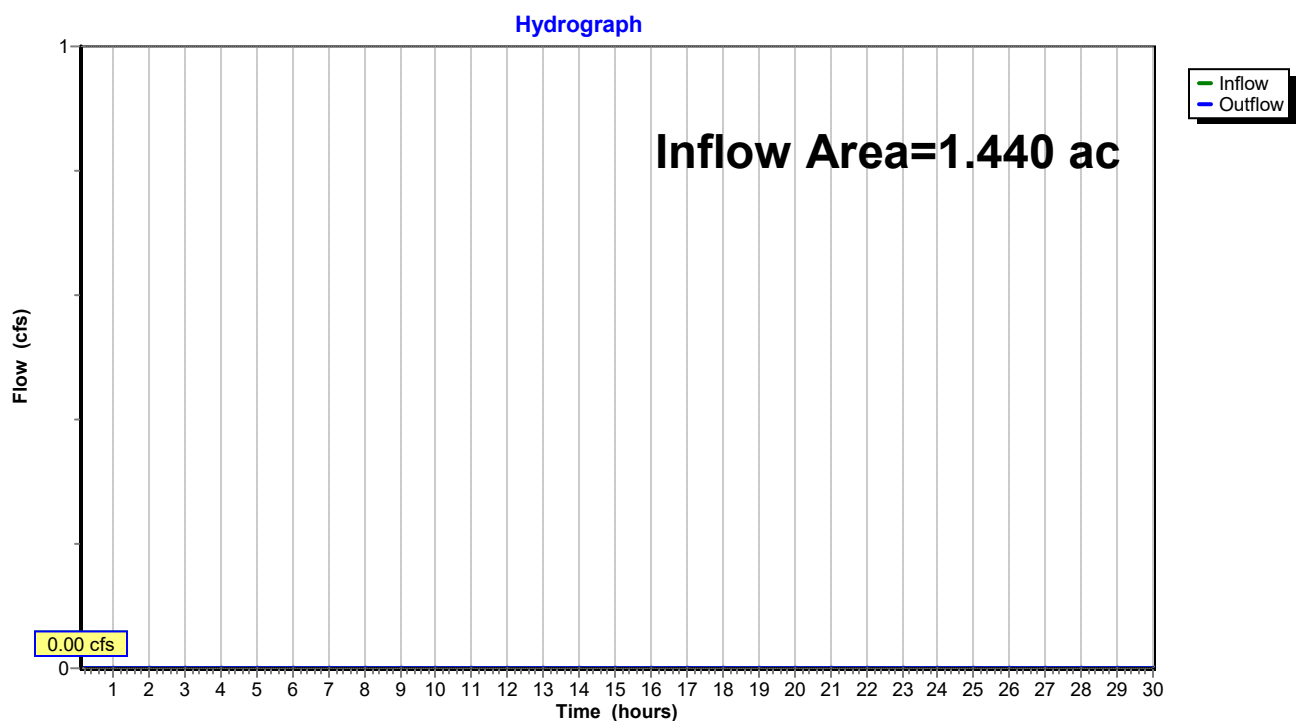
Summary for Reach 1R: (new Reach)

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 1.440 ac, 0.00% Impervious, Inflow Depth = 0.00" for 2-Year event
Inflow = 0.00 cfs @ 0.10 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 0.10 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.10-30.00 hrs, dt= 0.05 hrs

Reach 1R: (new Reach)



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Type III 24-hr 2-Year Rainfall=3.31"

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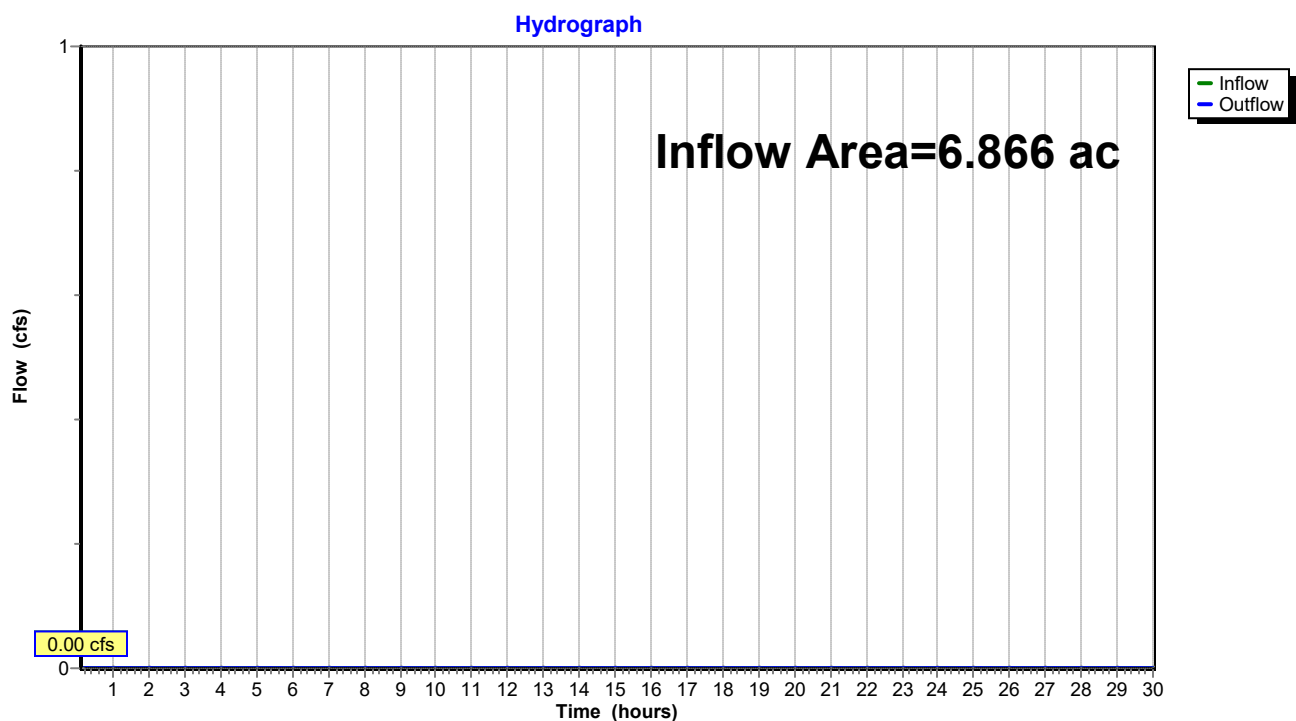
Summary for Reach 2R: (new Reach)

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 6.866 ac, 0.00% Impervious, Inflow Depth = 0.00" for 2-Year event
Inflow = 0.00 cfs @ 0.10 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 0.10 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.10-30.00 hrs, dt= 0.05 hrs

Reach 2R: (new Reach)



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Type III 24-hr 2-Year Rainfall=3.31"

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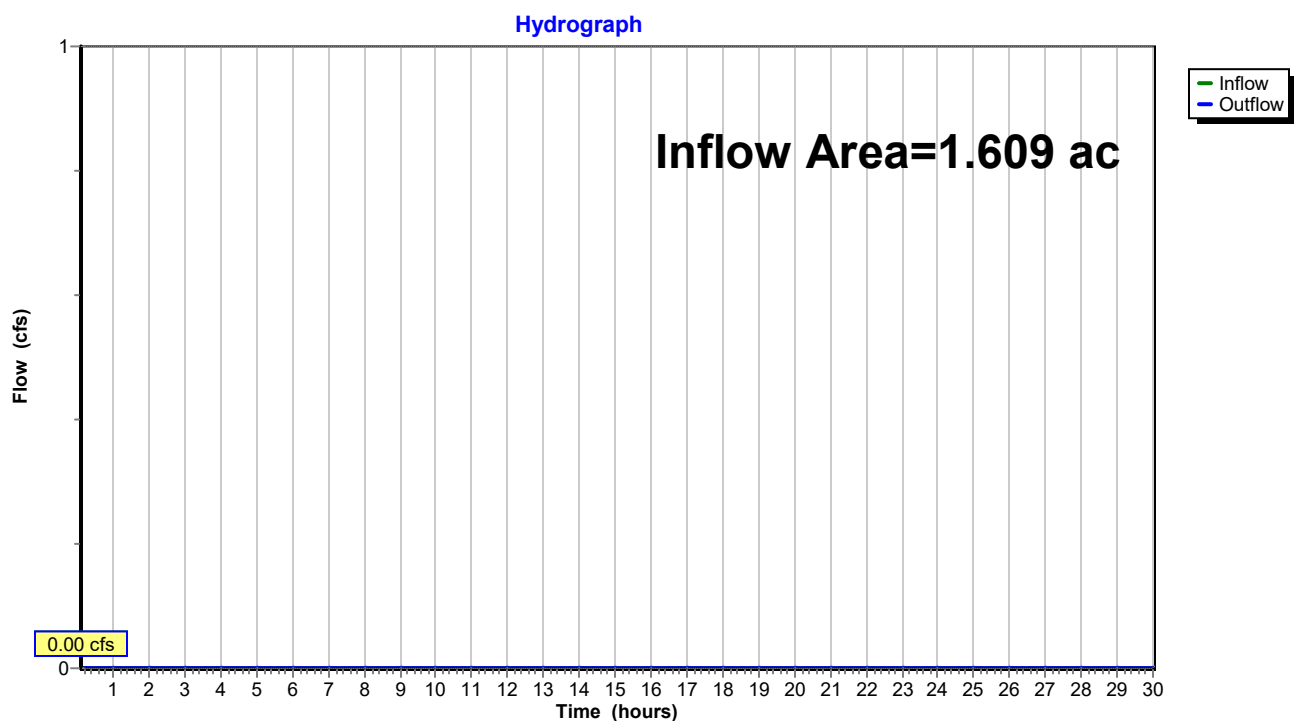
Summary for Reach 3R: (new Reach)

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 1.609 ac, 0.00% Impervious, Inflow Depth = 0.00" for 2-Year event
Inflow = 0.00 cfs @ 0.10 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 0.10 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.10-30.00 hrs, dt= 0.05 hrs

Reach 3R: (new Reach)



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Type III 24-hr 2-Year Rainfall=3.31"

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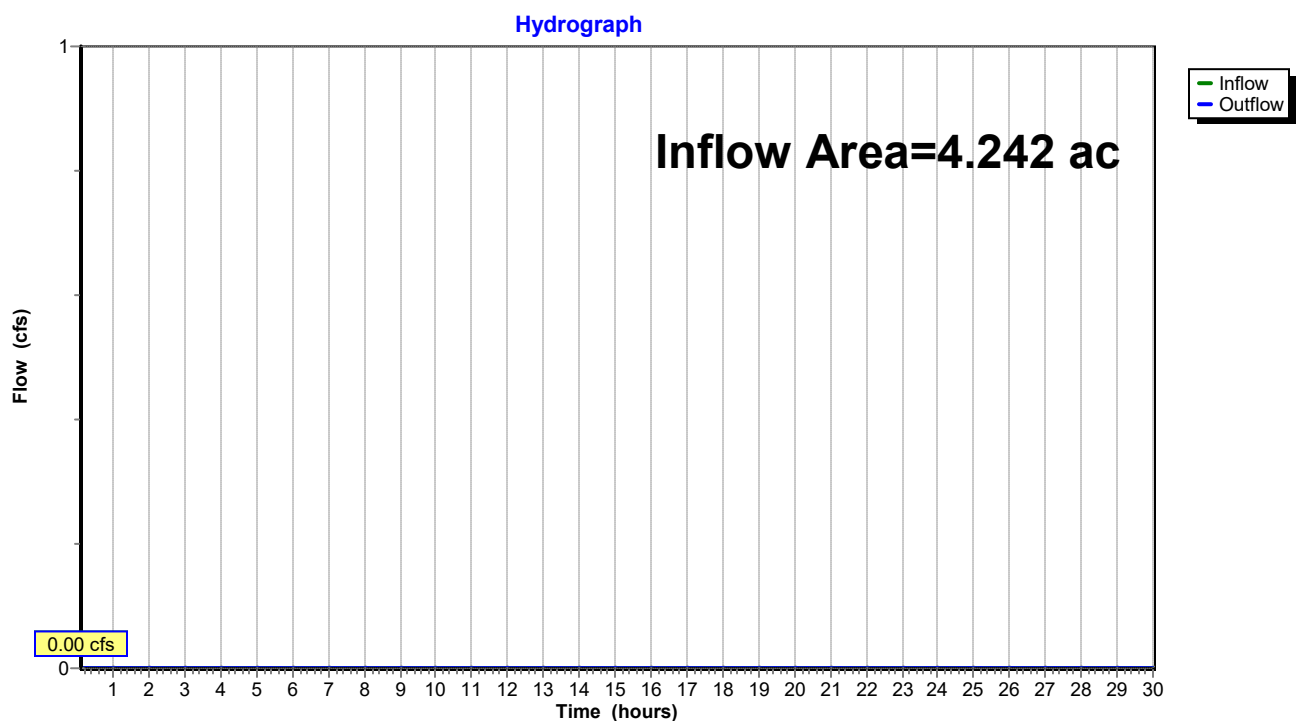
Summary for Reach 4R: (new Reach)

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 4.242 ac, 0.00% Impervious, Inflow Depth = 0.00" for 2-Year event
Inflow = 0.00 cfs @ 0.10 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 0.10 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.10-30.00 hrs, dt= 0.05 hrs

Reach 4R: (new Reach)



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Type III 24-hr 2-Year Rainfall=3.31"

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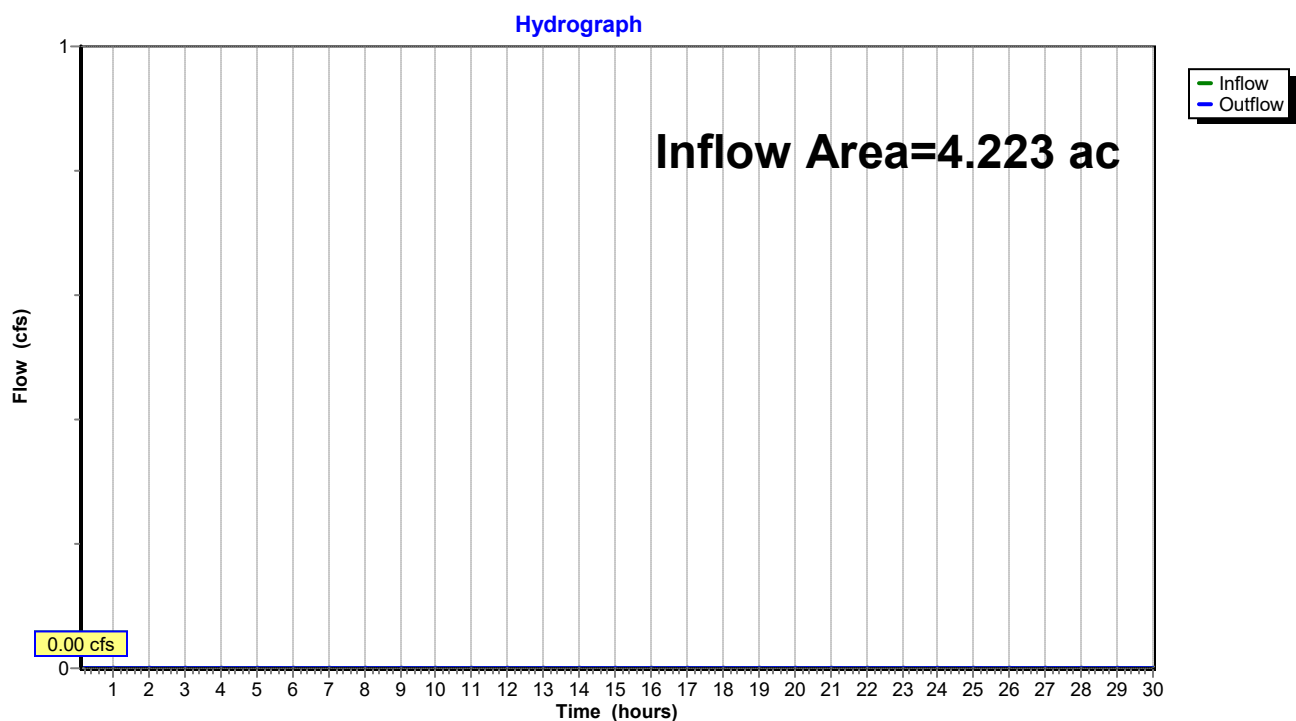
Summary for Reach 5R: (new Reach)

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 4.223 ac, 0.00% Impervious, Inflow Depth = 0.00" for 2-Year event
Inflow = 0.00 cfs @ 0.10 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 0.10 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.10-30.00 hrs, dt= 0.05 hrs

Reach 5R: (new Reach)



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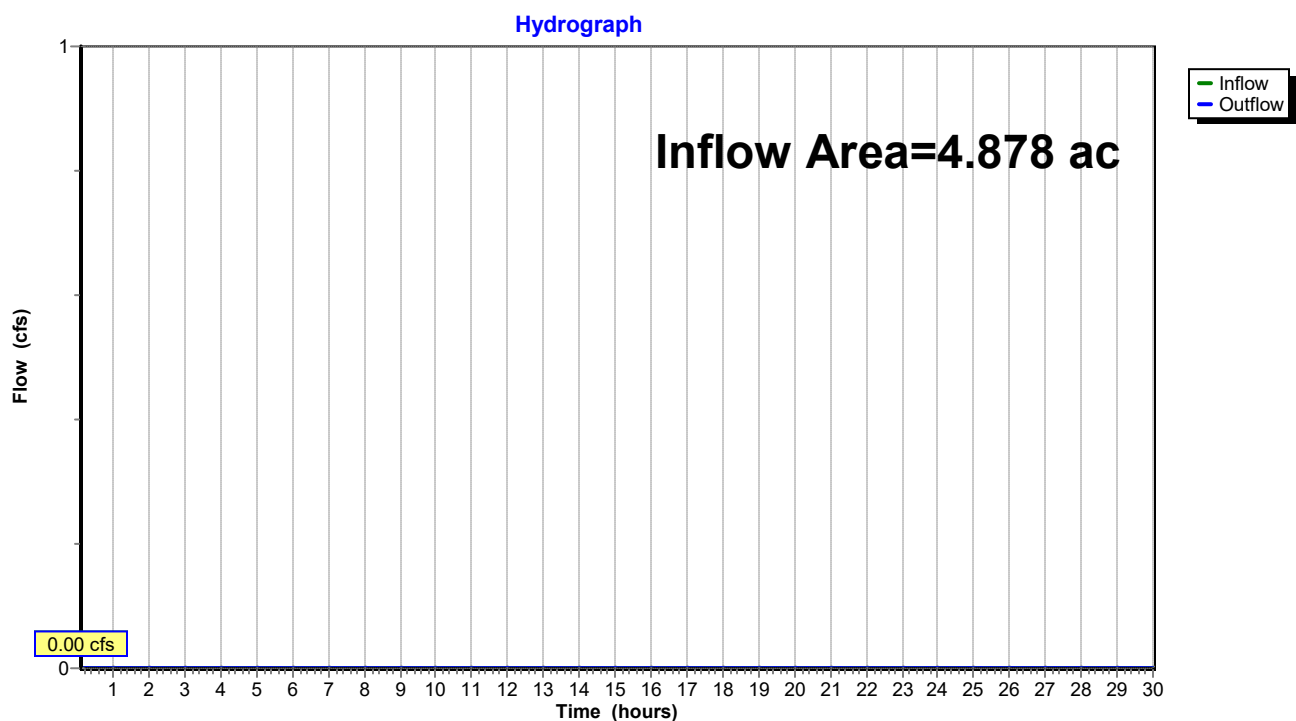
Summary for Reach 6R: (new Reach)

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 4.878 ac, 0.00% Impervious, Inflow Depth = 0.00" for 2-Year event
Inflow = 0.00 cfs @ 0.10 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 0.10 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.10-30.00 hrs, dt= 0.05 hrs

Reach 6R: (new Reach)



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Type III 24-hr 10-Year Rainfall=4.88"

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Time span=0.10-30.00 hrs, dt=0.05 hrs, 599 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: PRE AREA A1	Runoff Area=62,707 sf 0.00% Impervious Runoff Depth=0.01" Flow Length=89' Tc=7.9 min CN=31 Runoff=0.00 cfs 0.001 af
Subcatchment 2S: PRE AREA A2	Runoff Area=299,064 sf 0.00% Impervious Runoff Depth=0.05" Flow Length=434' Tc=21.7 min CN=34 Runoff=0.04 cfs 0.028 af
Subcatchment 3S: PRE AREA A3	Runoff Area=70,068 sf 0.00% Impervious Runoff Depth=0.07" Flow Length=148' Tc=13.0 min CN=35 Runoff=0.01 cfs 0.009 af
Subcatchment 4S: PRE AREA C1	Runoff Area=184,766 sf 0.00% Impervious Runoff Depth=0.01" Flow Length=245' Tc=15.2 min CN=31 Runoff=0.01 cfs 0.003 af
Subcatchment 5S: PRE AREA C2	Runoff Area=183,945 sf 0.00% Impervious Runoff Depth=0.02" Flow Length=131' Slope=0.0060 '/' Tc=14.0 min CN=32 Runoff=0.01 cfs 0.006 af
Subcatchment 6S: PRE AREA C3	Runoff Area=212,498 sf 0.00% Impervious Runoff Depth=0.00" Flow Length=238' Tc=7.1 min CN=30 Runoff=0.00 cfs 0.001 af
Reach 1R: (new Reach)	Inflow=0.00 cfs 0.001 af Outflow=0.00 cfs 0.001 af
Reach 2R: (new Reach)	Inflow=0.04 cfs 0.028 af Outflow=0.04 cfs 0.028 af
Reach 3R: (new Reach)	Inflow=0.01 cfs 0.009 af Outflow=0.01 cfs 0.009 af
Reach 4R: (new Reach)	Inflow=0.01 cfs 0.003 af Outflow=0.01 cfs 0.003 af
Reach 5R: (new Reach)	Inflow=0.01 cfs 0.006 af Outflow=0.01 cfs 0.006 af
Reach 6R: (new Reach)	Inflow=0.00 cfs 0.001 af Outflow=0.00 cfs 0.001 af

Total Runoff Area = 23.256 ac Runoff Volume = 0.048 af Average Runoff Depth = 0.02"
100.00% Pervious = 23.256 ac 0.00% Impervious = 0.000 ac

PRE CONDITIONS CHIPAWAY

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Type III 24-hr 10-Year Rainfall=4.88"

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Summary for Subcatchment 1S: PRE AREA A1

IMPERVIOUS AREA PER PANEL TABLE IS 0.698 S.F.

52 PANEL TABLES X 0.698 = 36.3 S.F.

Runoff = 0.00 cfs @ 23.18 hrs, Volume= 0.001 af, Depth= 0.01"

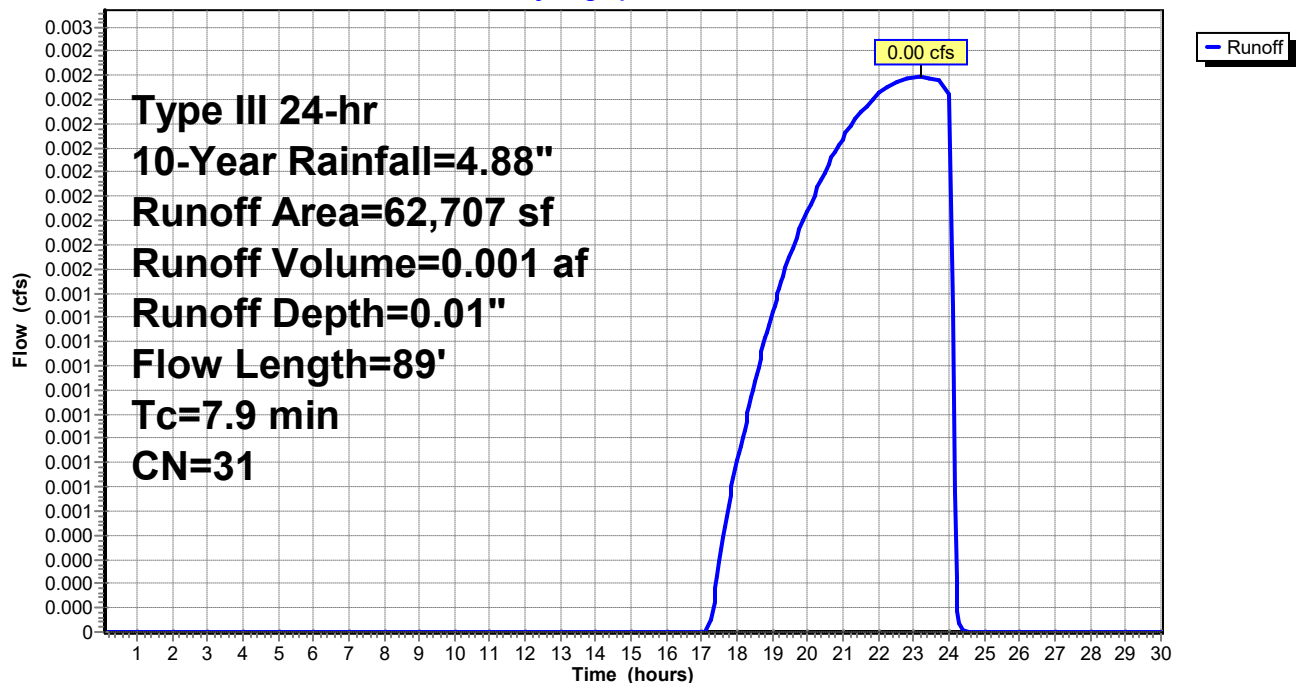
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.10-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.88"

Area (sf)	CN	Description
53,603	30	Woods, Good, HSG A
9,104	39	>75% Grass cover, Good, HSG A
62,707	31	Weighted Average
62,707		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0	35	0.0050	0.08		Sheet Flow, Grass: Short n= 0.150 P2= 3.50"
0.6	26	0.0100	0.70		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.3	28	0.0500	1.57		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
7.9	89	Total			

Subcatchment 1S: PRE AREA A1

Hydrograph



PRE CONDITIONS CHIPAWAY

Type III 24-hr 10-Year Rainfall=4.88"

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Summary for Subcatchment 2S: PRE AREA A2

IMPERVIOUS AREA PER PANEL TABLE IS 0.698 S.F.

52 PANEL TABLES X 0.698 = 36.3 S.F.

Runoff = 0.04 cfs @ 15.94 hrs, Volume= 0.028 af, Depth= 0.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.10-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.88"

Area (sf)	CN	Description
170,171	30	Woods, Good, HSG A
128,893	39	>75% Grass cover, Good, HSG A
299,064	34	Weighted Average
299,064		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.5	25	0.0080	0.09		Sheet Flow, Grass: Short n= 0.150 P2= 3.50"
2.6	98	0.0080	0.63		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
12.4	236	0.0040	0.32		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
2.2	75	0.0130	0.57		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
21.7	434	Total			

PRE CONDITIONS CHIPAWAY

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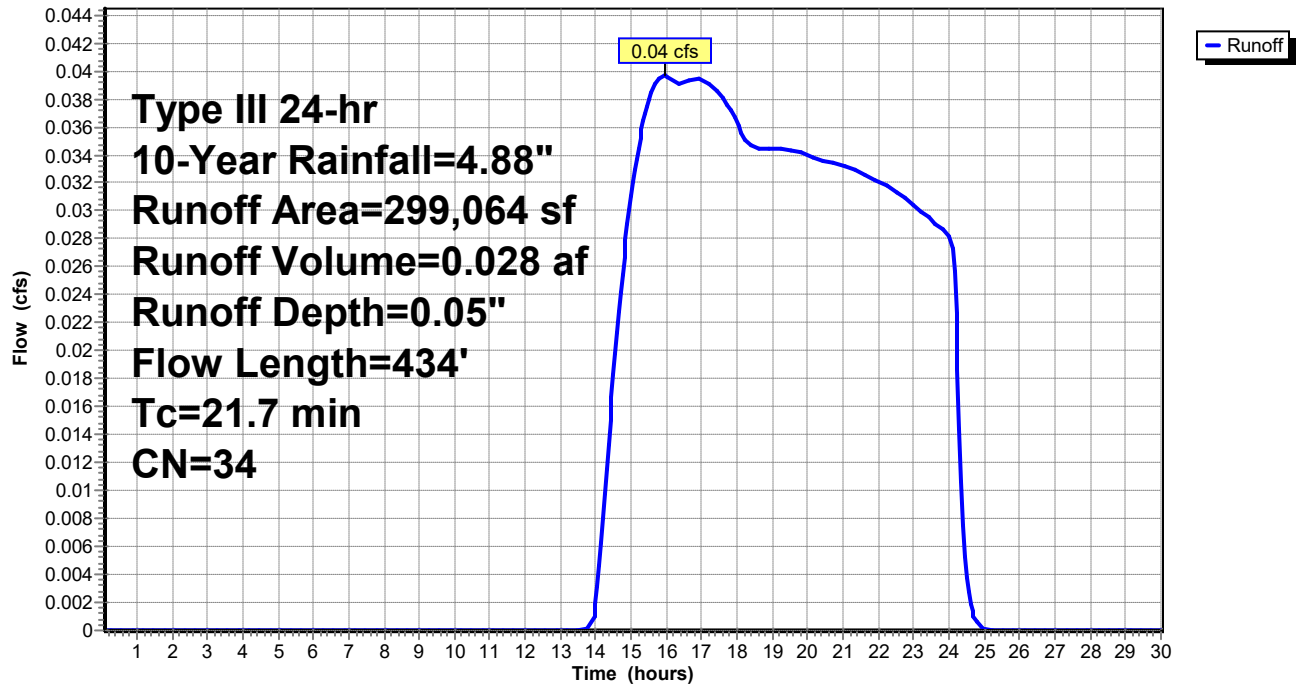
Type III 24-hr 10-Year Rainfall=4.88"

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Subcatchment 2S: PRE AREA A2

Hydrograph



PRE CONDITIONS CHIPAWAY

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Summary for Subcatchment 3S: PRE AREA A3

IMPERVIOUS AREA PER PANEL TABLE IS 0.698 S.F.

52 PANEL TABLES X 0.698 = 36.3 S.F.

Runoff = 0.01 cfs @ 15.43 hrs, Volume= 0.009 af, Depth= 0.07"

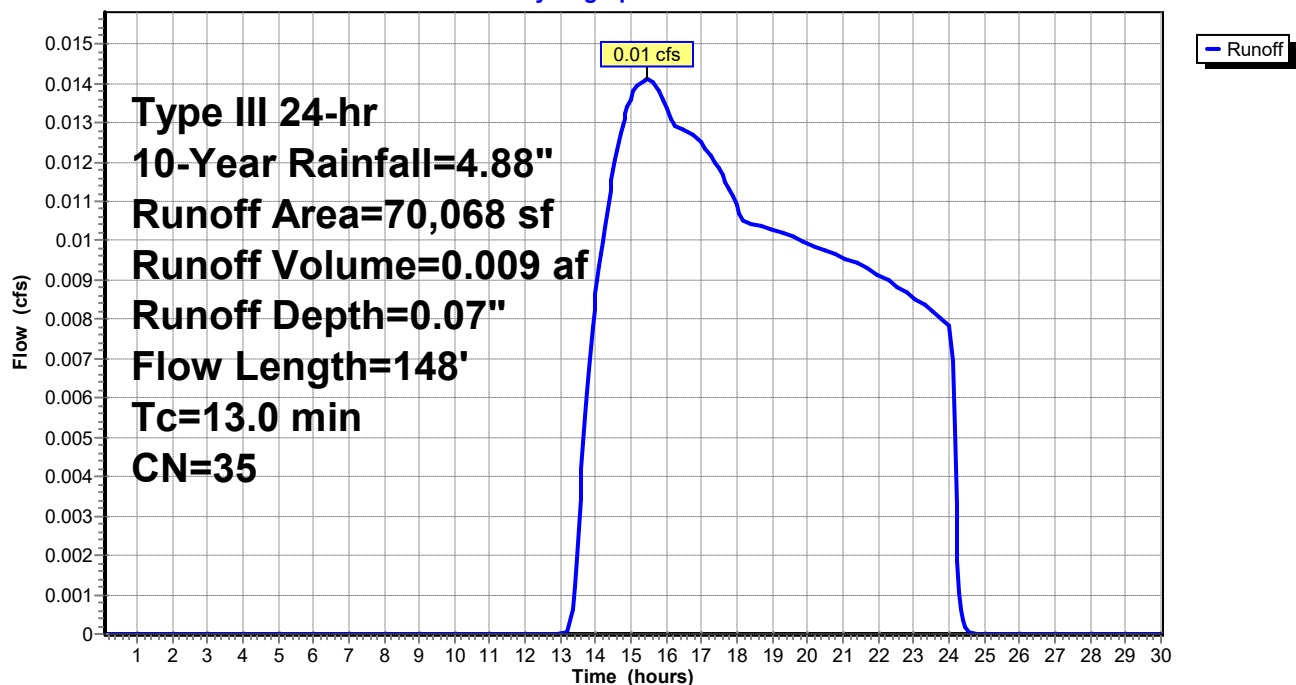
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.10-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.88"

Area (sf)	CN	Description
29,051	30	Woods, Good, HSG A
41,017	39	>75% Grass cover, Good, HSG A
70,068	35	Weighted Average
70,068		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.6	25	0.0110	0.05		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.50"
1.7	55	0.0110	0.52		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
2.7	68	0.0070	0.42		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
13.0	148	Total			

Subcatchment 3S: PRE AREA A3

Hydrograph



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Type III 24-hr 10-Year Rainfall=4.88"

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Summary for Subcatchment 4S: PRE AREA C1

Runoff = 0.01 cfs @ 23.30 hrs, Volume= 0.003 af, Depth= 0.01"

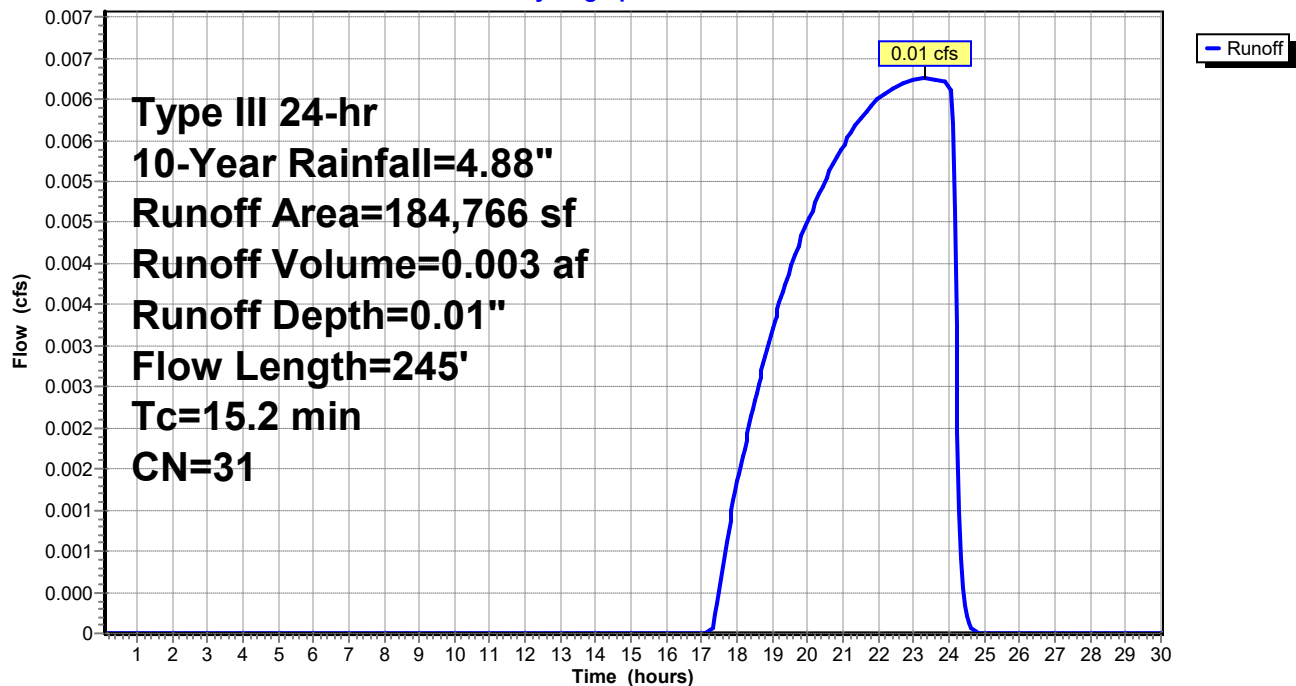
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.10-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.88"

Area (sf)	CN	Description
178,266	30	Woods, Good, HSG A
6,500	72	Dirt roads, HSG A
184,766	31	Weighted Average
184,766		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.9	20	0.0050	0.03		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.50"
5.3	225	0.0200	0.71		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
15.2	245	Total			

Subcatchment 4S: PRE AREA C1

Hydrograph



PRE CONDITIONS CHIPAWAY

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Type III 24-hr 10-Year Rainfall=4.88"

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Summary for Subcatchment 5S: PRE AREA C2

Runoff = 0.01 cfs @ 21.89 hrs, Volume= 0.006 af, Depth= 0.02"

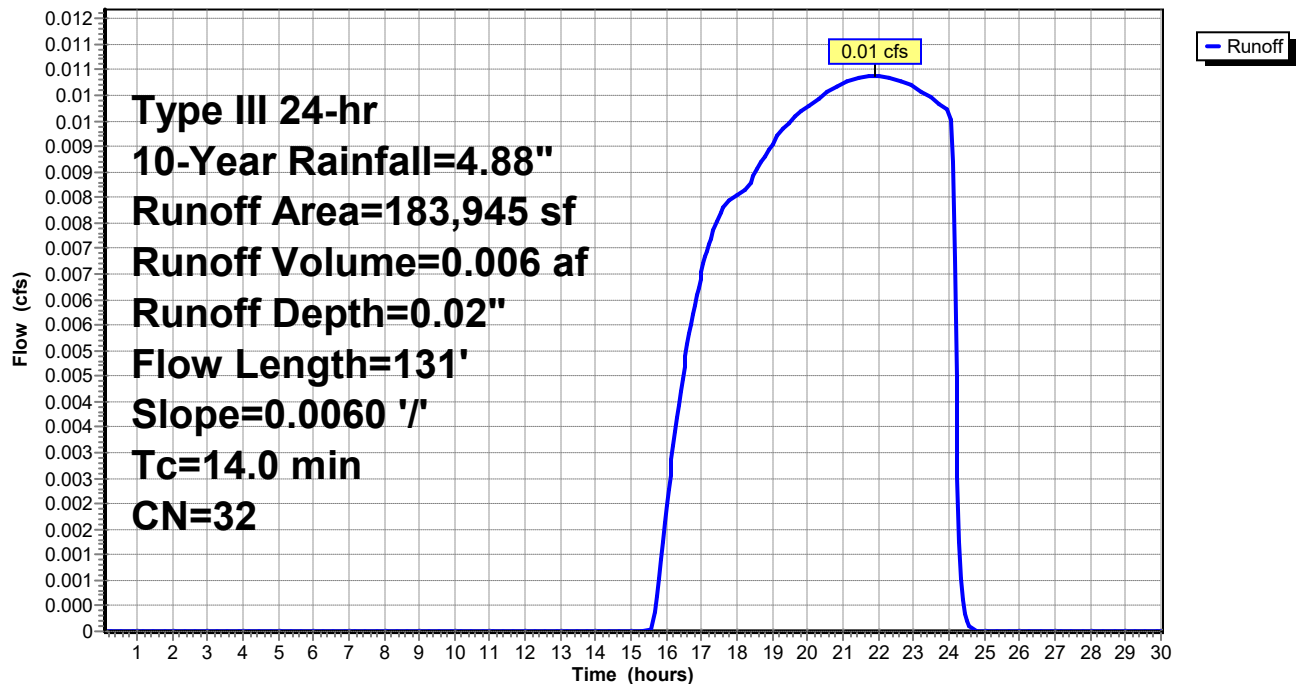
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.10-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.88"

Area (sf)	CN	Description
175,545	30	Woods, Good, HSG A
8,400	72	Dirt roads, HSG A
183,945	32	Weighted Average
183,945		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.2	20	0.0060	0.04		Sheet Flow,
					Woods: Light underbrush n= 0.400 P2= 3.50"
4.8	111	0.0060	0.39		Shallow Concentrated Flow,
					Woodland Kv= 5.0 fps
14.0	131	Total			

Subcatchment 5S: PRE AREA C2

Hydrograph



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Summary for Subcatchment 6S: PRE AREA C3

Runoff = 0.00 cfs @ 24.00 hrs, Volume= 0.001 af, Depth= 0.00"

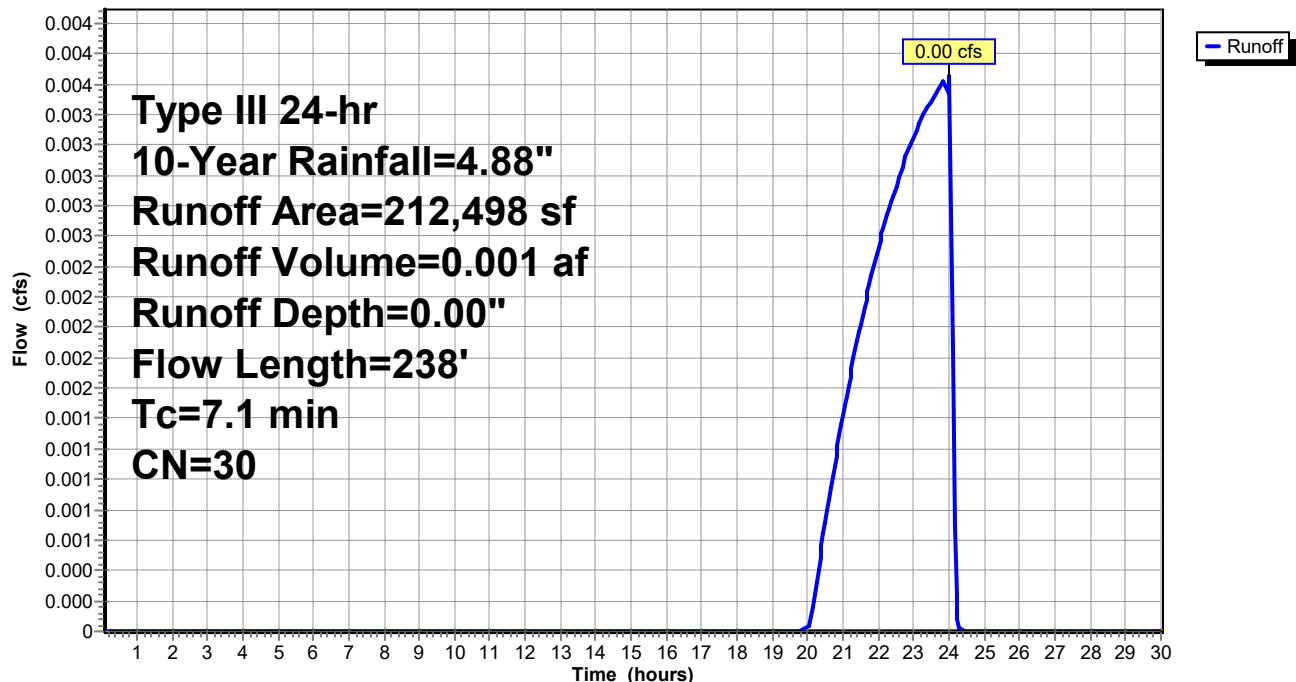
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.10-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.88"

Area (sf)	CN	Description
210,108	30	Woods, Good, HSG A
2,390	72	Dirt roads, HSG A
212,498	30	Weighted Average
212,498		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.5	20	0.0220	0.06		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.50"
1.6	218	0.2100	2.29		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
7.1	238	Total			

Subcatchment 6S: PRE AREA C3

Hydrograph



PRE CONDITIONS CHIPAWAY

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Type III 24-hr 10-Year Rainfall=4.88"

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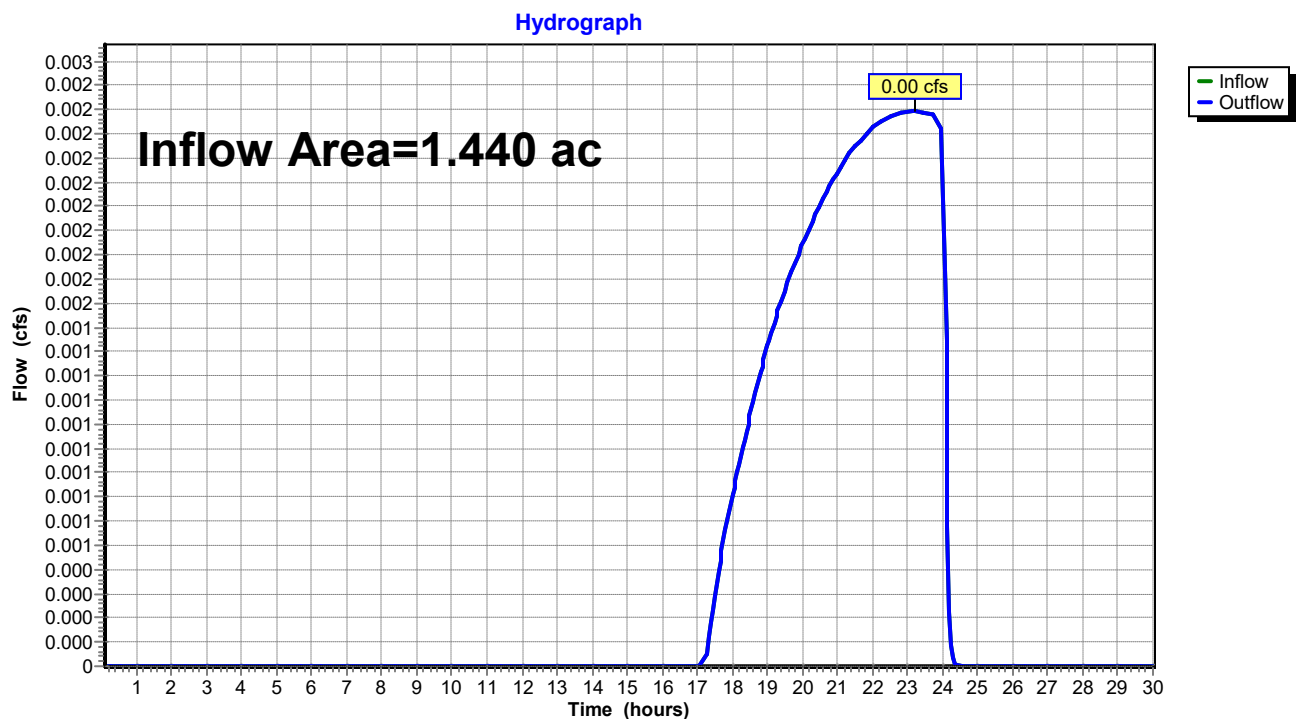
Summary for Reach 1R: (new Reach)

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 1.440 ac, 0.00% Impervious, Inflow Depth = 0.01" for 10-Year event
Inflow = 0.00 cfs @ 23.18 hrs, Volume= 0.001 af
Outflow = 0.00 cfs @ 23.18 hrs, Volume= 0.001 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.10-30.00 hrs, dt= 0.05 hrs

Reach 1R: (new Reach)



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Type III 24-hr 10-Year Rainfall=4.88"

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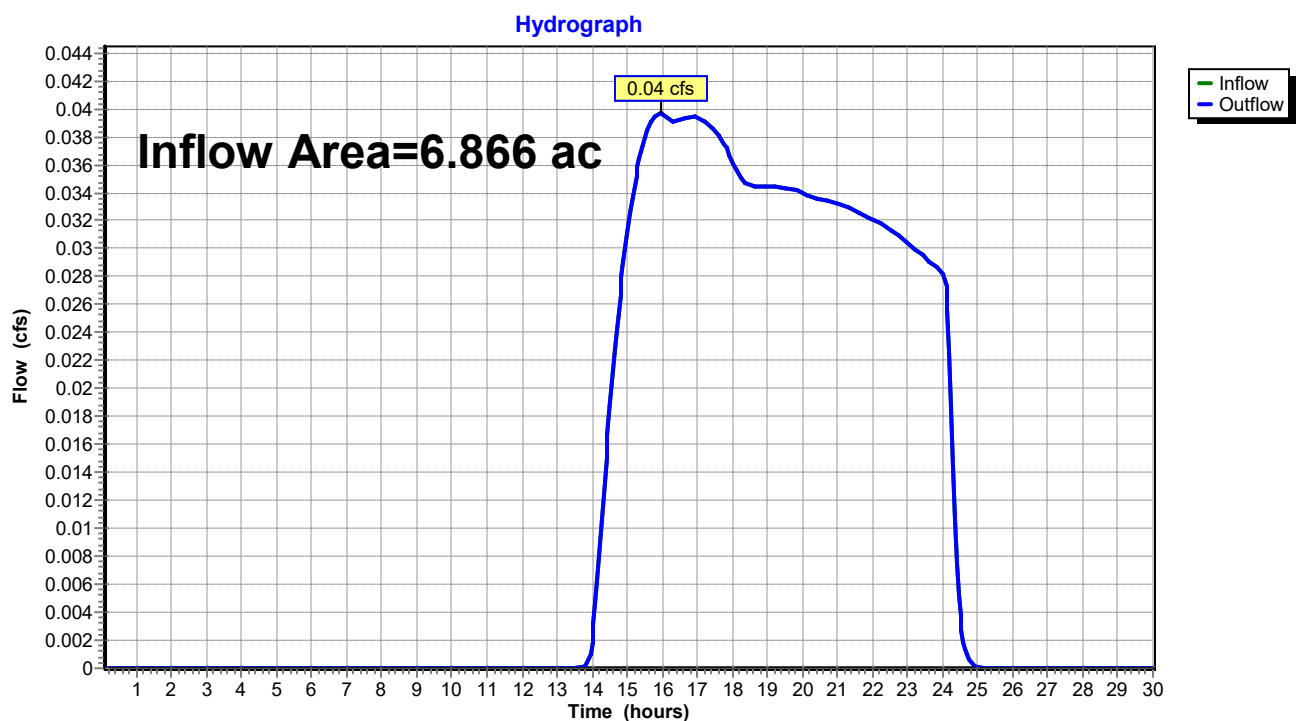
Summary for Reach 2R: (new Reach)

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 6.866 ac, 0.00% Impervious, Inflow Depth = 0.05" for 10-Year event
Inflow = 0.04 cfs @ 15.94 hrs, Volume= 0.028 af
Outflow = 0.04 cfs @ 15.94 hrs, Volume= 0.028 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.10-30.00 hrs, dt= 0.05 hrs

Reach 2R: (new Reach)



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Type III 24-hr 10-Year Rainfall=4.88"

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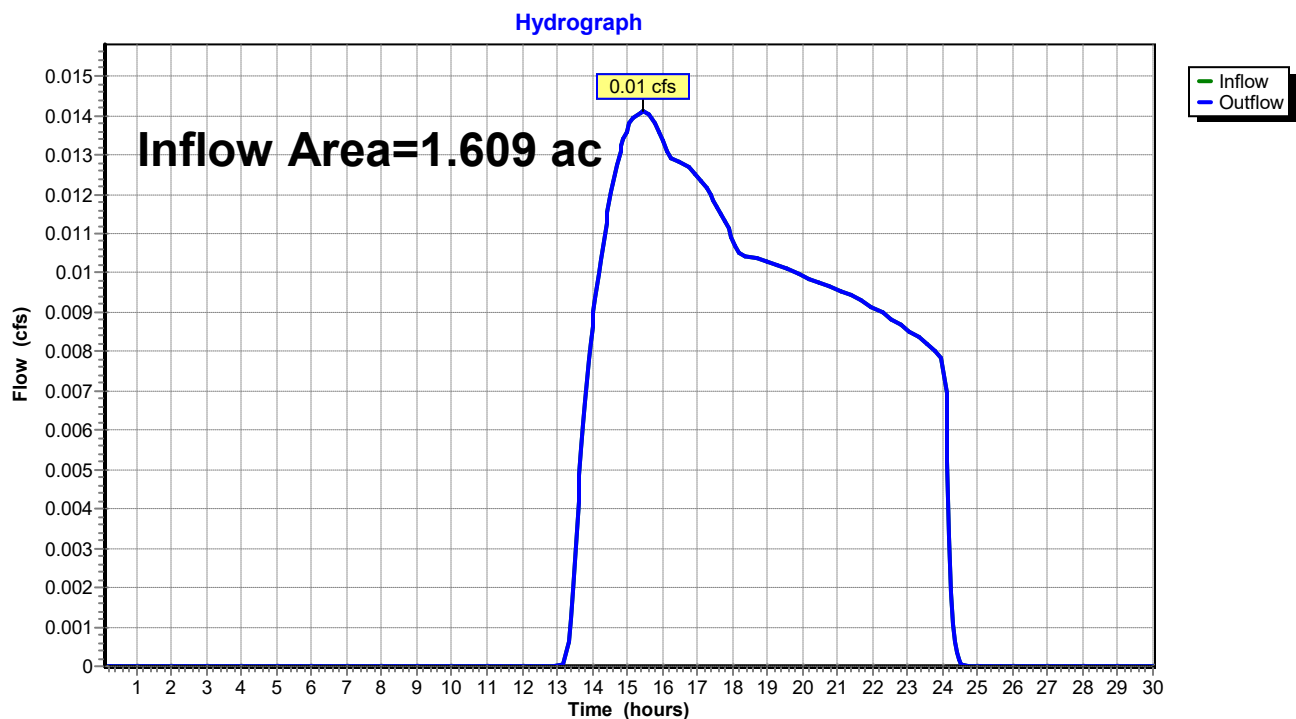
Summary for Reach 3R: (new Reach)

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 1.609 ac, 0.00% Impervious, Inflow Depth = 0.07" for 10-Year event
Inflow = 0.01 cfs @ 15.43 hrs, Volume= 0.009 af
Outflow = 0.01 cfs @ 15.43 hrs, Volume= 0.009 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.10-30.00 hrs, dt= 0.05 hrs

Reach 3R: (new Reach)



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Type III 24-hr 10-Year Rainfall=4.88"

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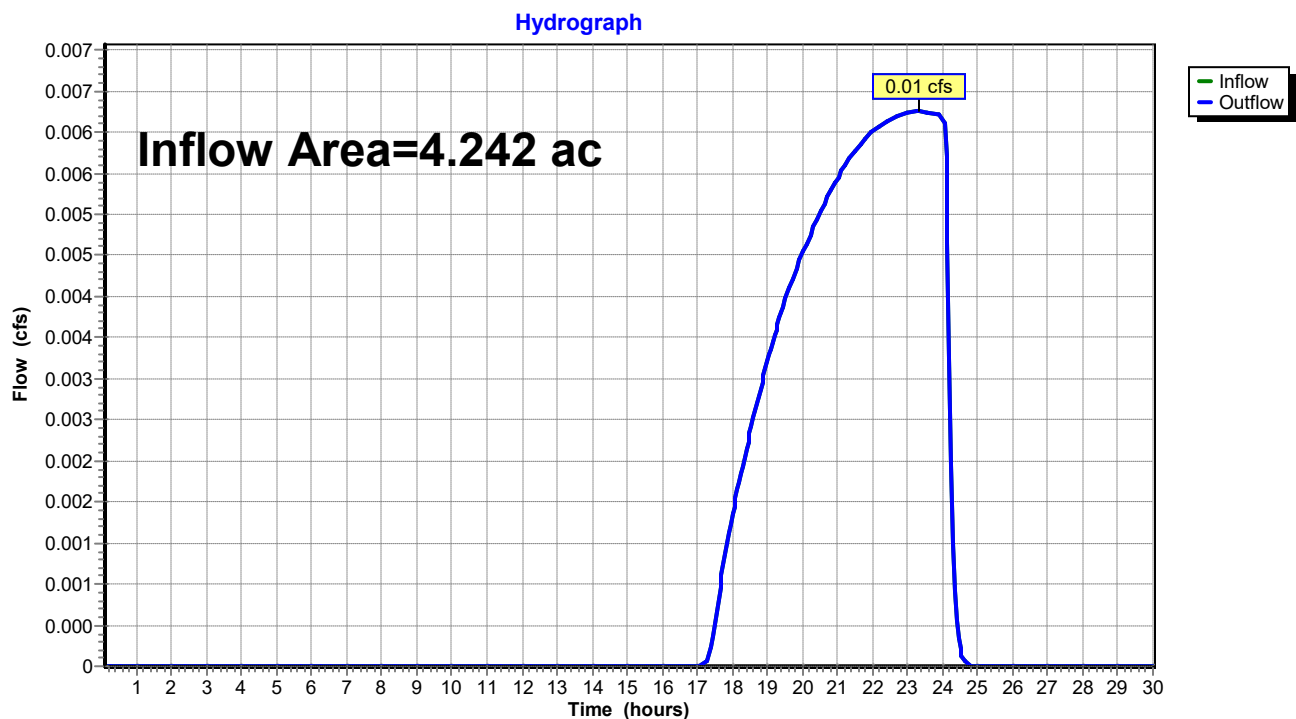
Summary for Reach 4R: (new Reach)

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 4.242 ac, 0.00% Impervious, Inflow Depth = 0.01" for 10-Year event
Inflow = 0.01 cfs @ 23.30 hrs, Volume= 0.003 af
Outflow = 0.01 cfs @ 23.30 hrs, Volume= 0.003 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.10-30.00 hrs, dt= 0.05 hrs

Reach 4R: (new Reach)



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Type III 24-hr 10-Year Rainfall=4.88"

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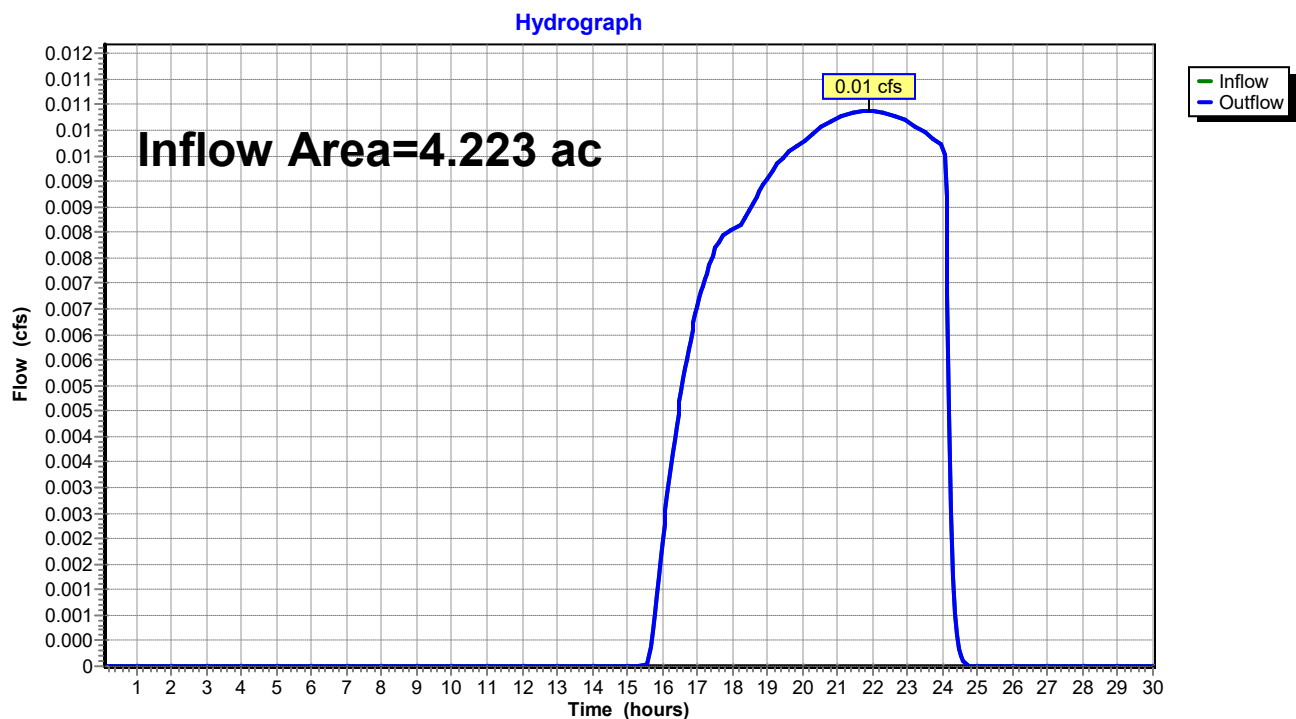
Summary for Reach 5R: (new Reach)

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 4.223 ac, 0.00% Impervious, Inflow Depth = 0.02" for 10-Year event
Inflow = 0.01 cfs @ 21.89 hrs, Volume= 0.006 af
Outflow = 0.01 cfs @ 21.89 hrs, Volume= 0.006 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.10-30.00 hrs, dt= 0.05 hrs

Reach 5R: (new Reach)



PRE CONDITIONS CHIPAWAY

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Summary for Reach 6R: (new Reach)

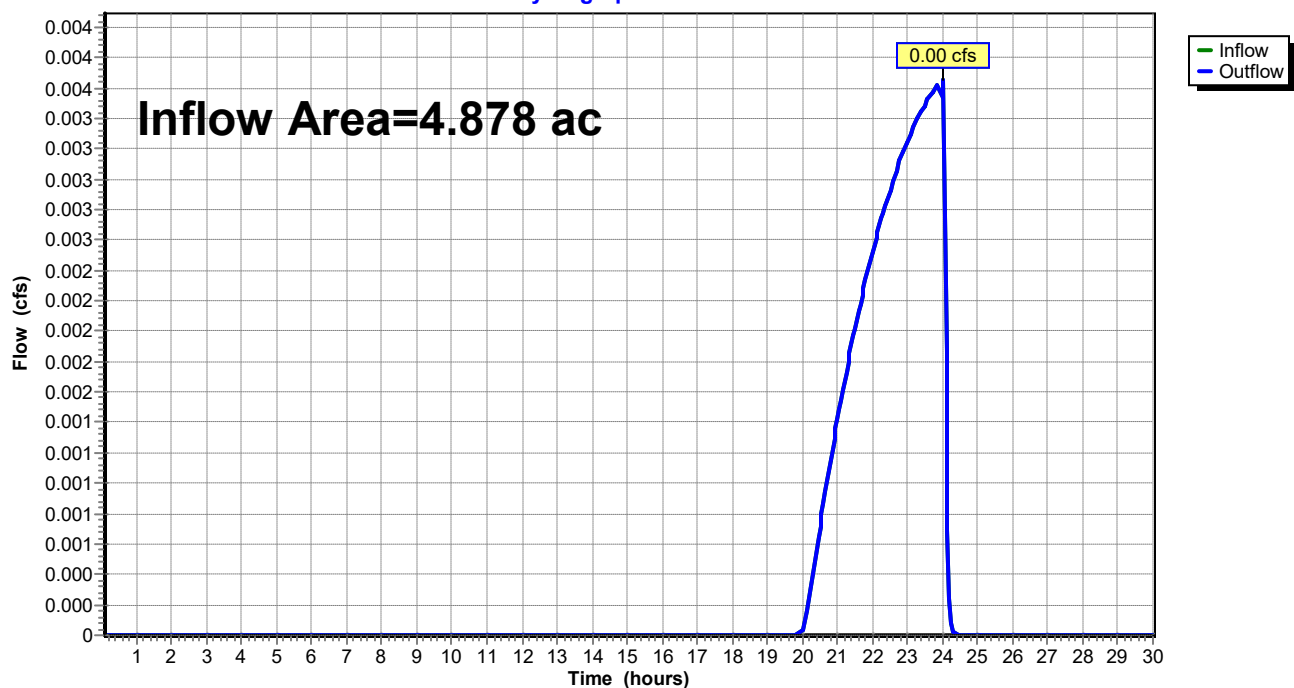
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 4.878 ac, 0.00% Impervious, Inflow Depth = 0.00" for 10-Year event
Inflow = 0.00 cfs @ 24.00 hrs, Volume= 0.001 af
Outflow = 0.00 cfs @ 24.00 hrs, Volume= 0.001 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.10-30.00 hrs, dt= 0.05 hrs

Reach 6R: (new Reach)

Hydrograph



PRE CONDITIONS CHIPAWAY*Type III 24-hr 100-Year Rainfall=8.52"*

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Time span=0.10-30.00 hrs, dt=0.05 hrs, 599 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: PRE AREA A1	Runoff Area=62,707 sf 0.00% Impervious Runoff Depth=0.63" Flow Length=89' Tc=7.9 min CN=31 Runoff=0.35 cfs 0.075 af
Subcatchment 2S: PRE AREA A2	Runoff Area=299,064 sf 0.00% Impervious Runoff Depth=0.89" Flow Length=434' Tc=21.7 min CN=34 Runoff=2.59 cfs 0.512 af
Subcatchment 3S: PRE AREA A3	Runoff Area=70,068 sf 0.00% Impervious Runoff Depth=0.99" Flow Length=148' Tc=13.0 min CN=35 Runoff=0.80 cfs 0.132 af
Subcatchment 4S: PRE AREA C1	Runoff Area=184,766 sf 0.00% Impervious Runoff Depth=0.63" Flow Length=245' Tc=15.2 min CN=31 Runoff=0.95 cfs 0.222 af
Subcatchment 5S: PRE AREA C2	Runoff Area=183,945 sf 0.00% Impervious Runoff Depth=0.71" Flow Length=131' Slope=0.0060 ' ' Tc=14.0 min CN=32 Runoff=1.20 cfs 0.251 af
Subcatchment 6S: PRE AREA C3	Runoff Area=212,498 sf 0.00% Impervious Runoff Depth=0.55" Flow Length=238' Tc=7.1 min CN=30 Runoff=0.93 cfs 0.222 af
Reach 1R: (new Reach)	Inflow=0.35 cfs 0.075 af Outflow=0.35 cfs 0.075 af
Reach 2R: (new Reach)	Inflow=2.59 cfs 0.512 af Outflow=2.59 cfs 0.512 af
Reach 3R: (new Reach)	Inflow=0.80 cfs 0.132 af Outflow=0.80 cfs 0.132 af
Reach 4R: (new Reach)	Inflow=0.95 cfs 0.222 af Outflow=0.95 cfs 0.222 af
Reach 5R: (new Reach)	Inflow=1.20 cfs 0.251 af Outflow=1.20 cfs 0.251 af
Reach 6R: (new Reach)	Inflow=0.93 cfs 0.222 af Outflow=0.93 cfs 0.222 af

Total Runoff Area = 23.256 ac Runoff Volume = 1.415 af Average Runoff Depth = 0.73"
100.00% Pervious = 23.256 ac 0.00% Impervious = 0.000 ac

PRE CONDITIONS CHIPAWAY

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Type III 24-hr 100-Year Rainfall=8.52"

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Summary for Subcatchment 1S: PRE AREA A1

IMPERVIOUS AREA PER PANEL TABLE IS 0.698 S.F.

52 PANEL TABLES X 0.698 = 36.3 S.F.

Runoff = 0.35 cfs @ 12.38 hrs, Volume= 0.075 af, Depth= 0.63"

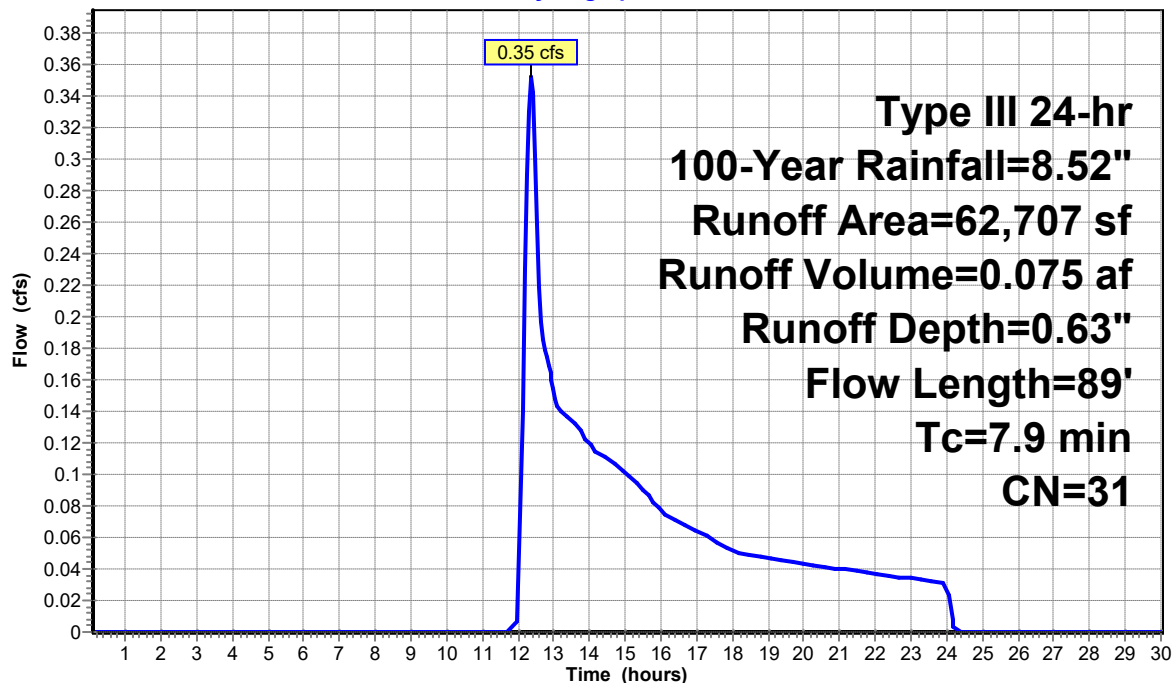
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.10-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=8.52"

Area (sf)	CN	Description
53,603	30	Woods, Good, HSG A
9,104	39	>75% Grass cover, Good, HSG A
62,707	31	Weighted Average
62,707		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0	35	0.0050	0.08		Sheet Flow, Grass: Short n= 0.150 P2= 3.50"
0.6	26	0.0100	0.70		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.3	28	0.0500	1.57		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
7.9	89	Total			

Subcatchment 1S: PRE AREA A1

Hydrograph



Runoff

PRE CONDITIONS CHIPAWAY

Type III 24-hr 100-Year Rainfall=8.52"

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Summary for Subcatchment 2S: PRE AREA A2

IMPERVIOUS AREA PER PANEL TABLE IS 0.698 S.F.

52 PANEL TABLES X 0.698 = 36.3 S.F.

Runoff = 2.59 cfs @ 12.50 hrs, Volume= 0.512 af, Depth= 0.89"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.10-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=8.52"

Area (sf)	CN	Description
170,171	30	Woods, Good, HSG A
128,893	39	>75% Grass cover, Good, HSG A
299,064	34	Weighted Average
299,064		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.5	25	0.0080	0.09		Sheet Flow, Grass: Short n= 0.150 P2= 3.50"
2.6	98	0.0080	0.63		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
12.4	236	0.0040	0.32		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
2.2	75	0.0130	0.57		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
21.7	434	Total			

PRE CONDITIONS CHIPAWAY

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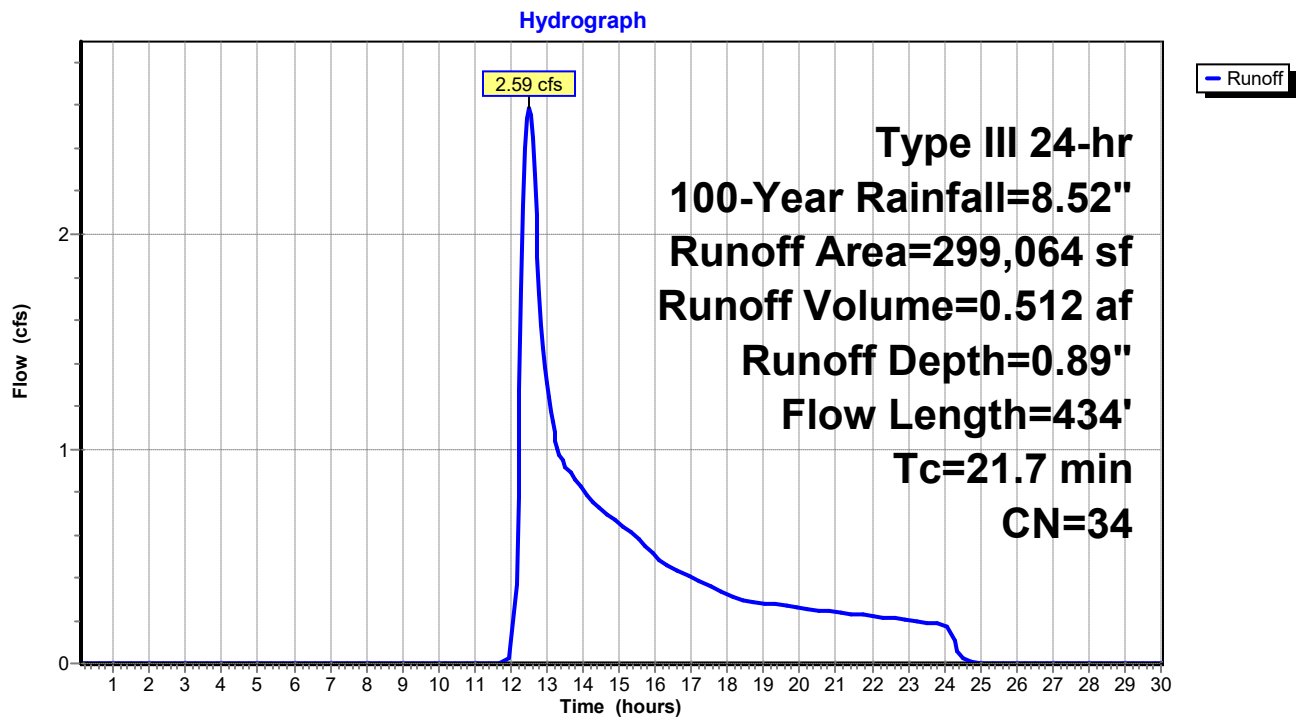
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Subcatchment 2S: PRE AREA A2



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Summary for Subcatchment 3S: PRE AREA A3

IMPERVIOUS AREA PER PANEL TABLE IS 0.698 S.F.

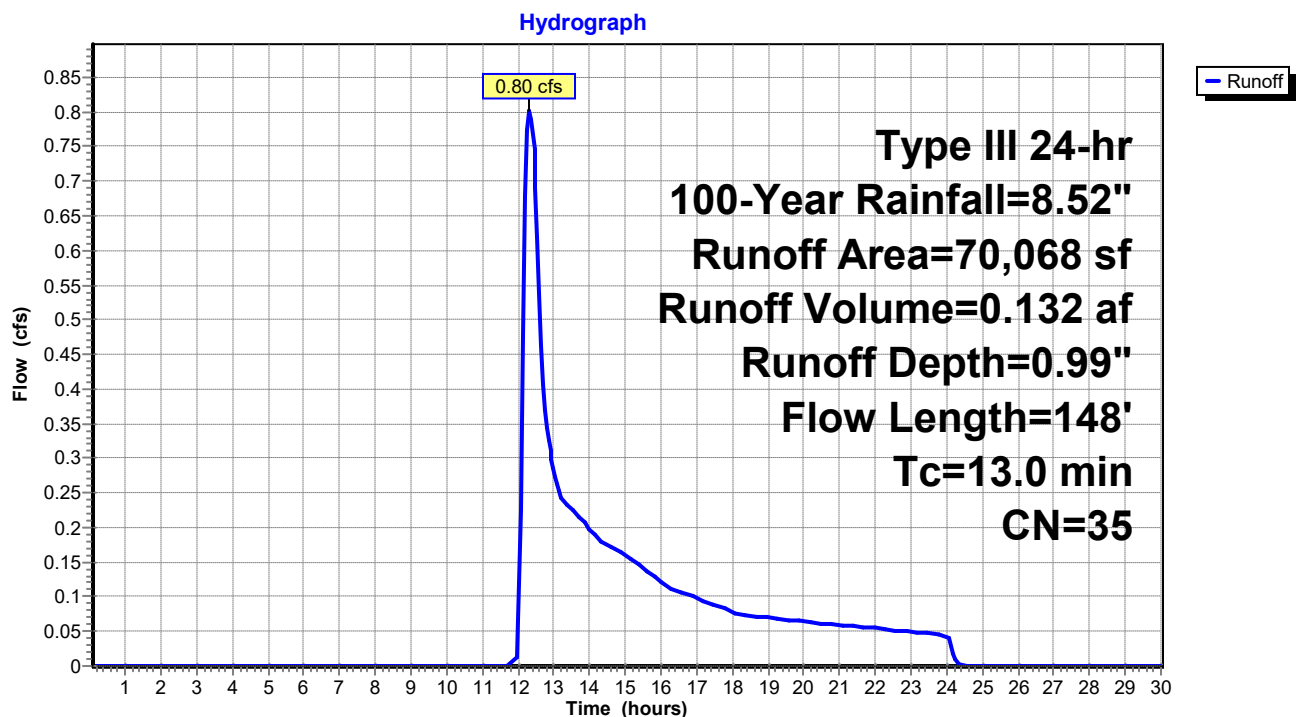
52 PANEL TABLES X 0.698 = 36.3 S.F.

Runoff = 0.80 cfs @ 12.32 hrs, Volume= 0.132 af, Depth= 0.99"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.10-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=8.52"

Area (sf)	CN	Description
29,051	30	Woods, Good, HSG A
41,017	39	>75% Grass cover, Good, HSG A
70,068	35	Weighted Average
70,068		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.6	25	0.0110	0.05		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.50"
1.7	55	0.0110	0.52		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
2.7	68	0.0070	0.42		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
13.0	148	Total			

Subcatchment 3S: PRE AREA A3

PRE CONDITIONS CHIPAWAY

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Type III 24-hr 100-Year Rainfall=8.52"

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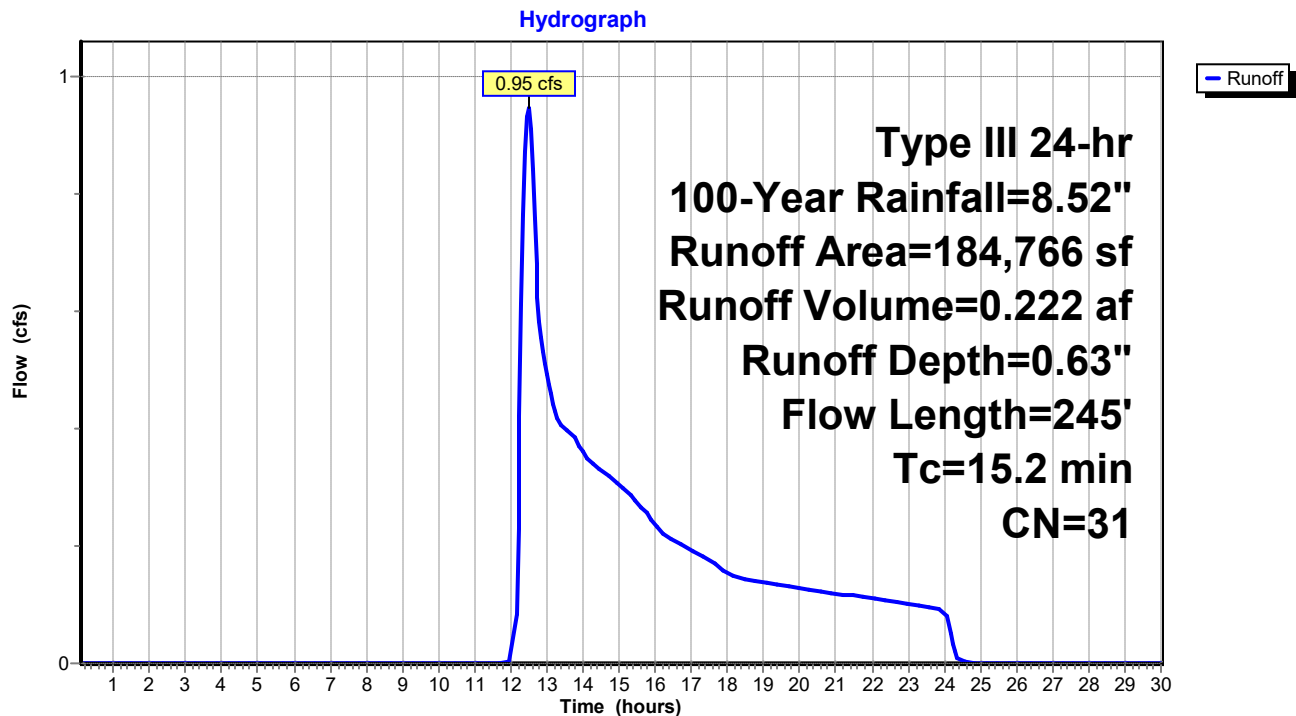
Summary for Subcatchment 4S: PRE AREA C1

Runoff = 0.95 cfs @ 12.49 hrs, Volume= 0.222 af, Depth= 0.63"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.10-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=8.52"

Area (sf)	CN	Description
178,266	30	Woods, Good, HSG A
6,500	72	Dirt roads, HSG A
184,766	31	Weighted Average
184,766		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.9	20	0.0050	0.03		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.50"
5.3	225	0.0200	0.71		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
15.2	245	Total			

Subcatchment 4S: PRE AREA C1

PRE CONDITIONS CHIPAWAY

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Type III 24-hr 100-Year Rainfall=8.52"

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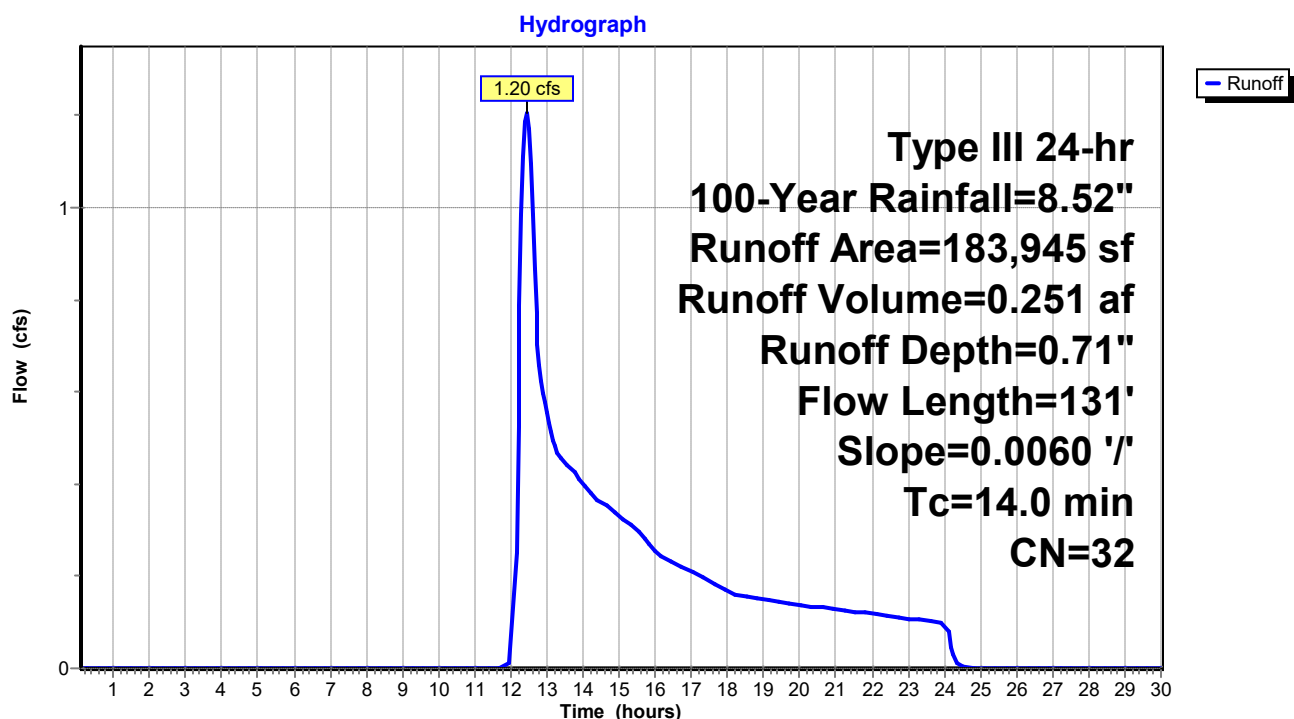
Summary for Subcatchment 5S: PRE AREA C2

Runoff = 1.20 cfs @ 12.44 hrs, Volume= 0.251 af, Depth= 0.71"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.10-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=8.52"

Area (sf)	CN	Description
175,545	30	Woods, Good, HSG A
8,400	72	Dirt roads, HSG A
183,945	32	Weighted Average
183,945		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.2	20	0.0060	0.04		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.50"
4.8	111	0.0060	0.39		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
14.0	131	Total			

Subcatchment 5S: PRE AREA C2

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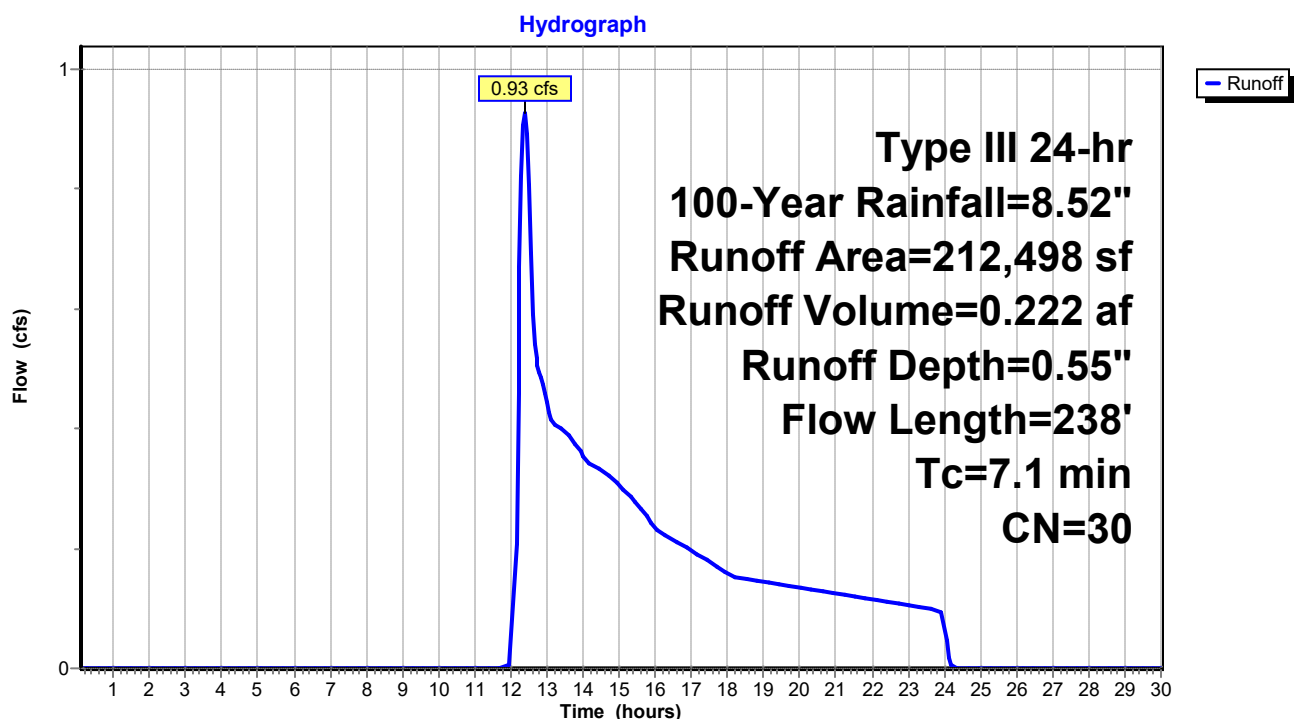
Summary for Subcatchment 6S: PRE AREA C3

Runoff = 0.93 cfs @ 12.39 hrs, Volume= 0.222 af, Depth= 0.55"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.10-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=8.52"

Area (sf)	CN	Description
210,108	30	Woods, Good, HSG A
2,390	72	Dirt roads, HSG A
212,498	30	Weighted Average
212,498		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.5	20	0.0220	0.06		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.50"
1.6	218	0.2100	2.29		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
7.1	238	Total			

Subcatchment 6S: PRE AREA C3

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Summary for Reach 1R: (new Reach)

[40] Hint: Not Described (Outflow=Inflow)

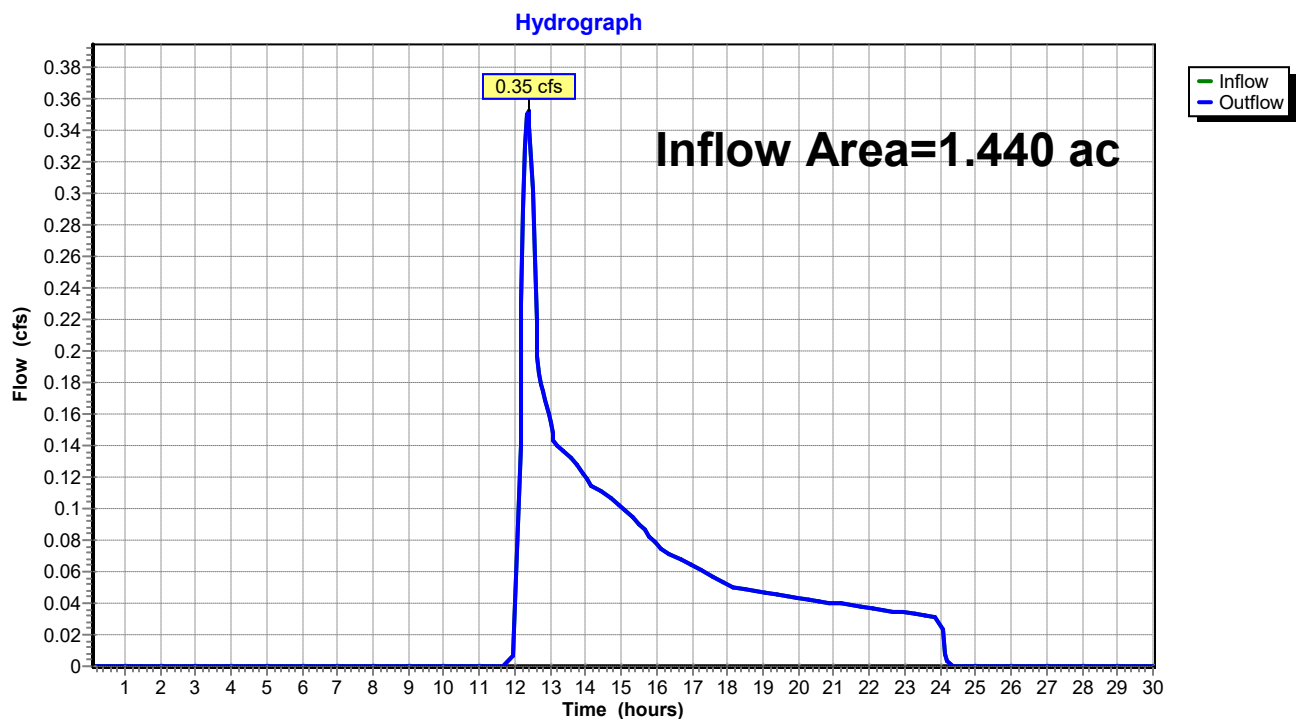
Inflow Area = 1.440 ac, 0.00% Impervious, Inflow Depth = 0.63" for 100-Year event

Inflow = 0.35 cfs @ 12.38 hrs, Volume= 0.075 af

Outflow = 0.35 cfs @ 12.38 hrs, Volume= 0.075 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.10-30.00 hrs, dt= 0.05 hrs

Reach 1R: (new Reach)



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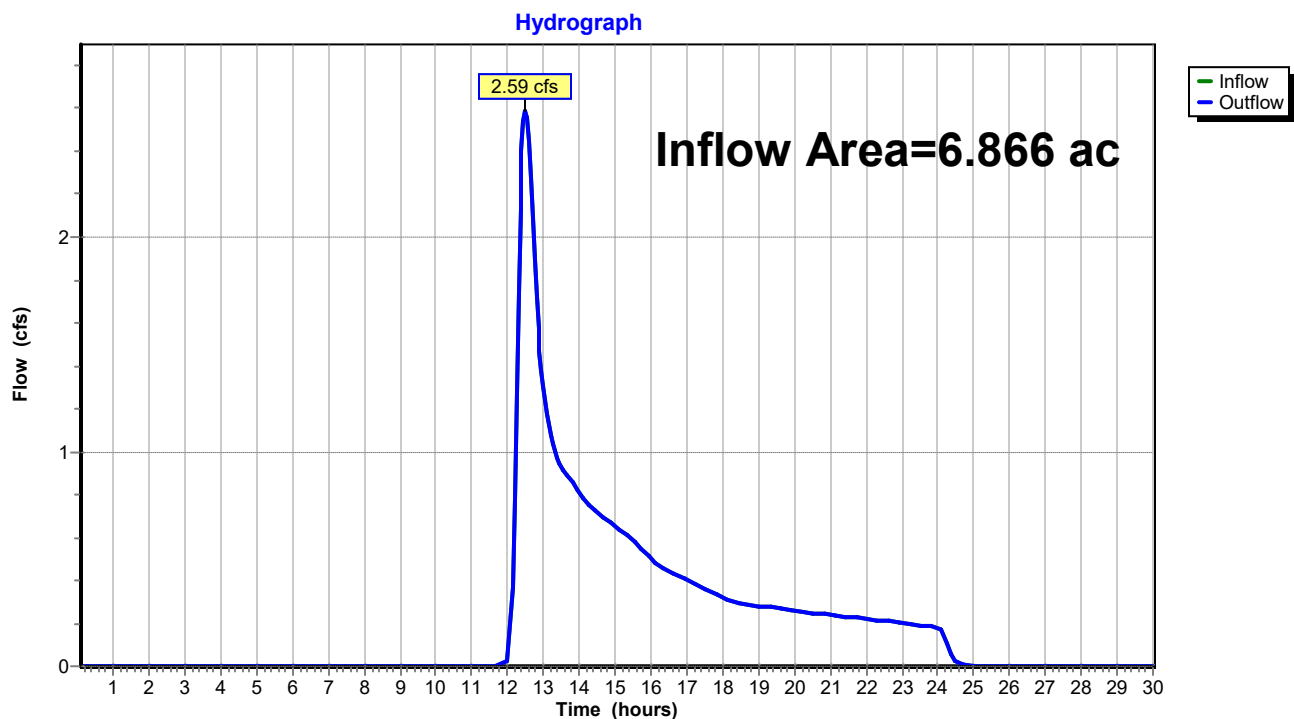
Summary for Reach 2R: (new Reach)

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 6.866 ac, 0.00% Impervious, Inflow Depth = 0.89" for 100-Year event
Inflow = 2.59 cfs @ 12.50 hrs, Volume= 0.512 af
Outflow = 2.59 cfs @ 12.50 hrs, Volume= 0.512 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.10-30.00 hrs, dt= 0.05 hrs

Reach 2R: (new Reach)



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Type III 24-hr 100-Year Rainfall=8.52"

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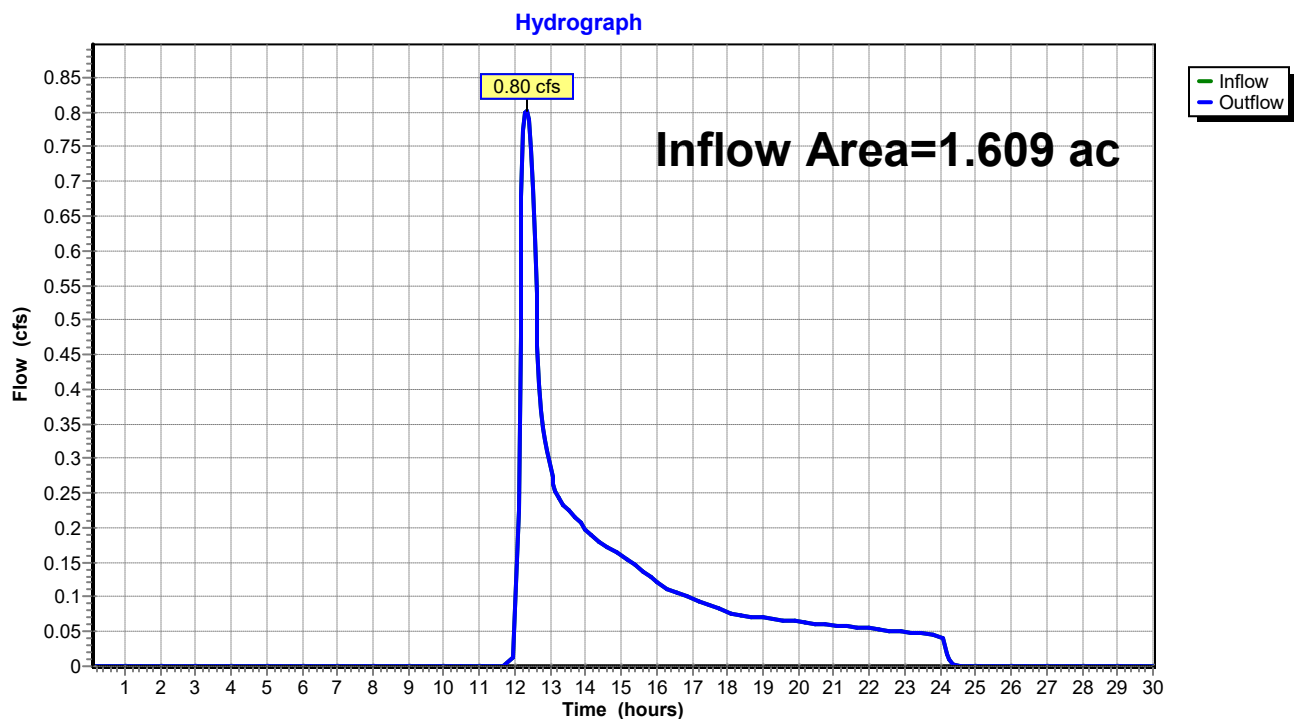
Summary for Reach 3R: (new Reach)

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 1.609 ac, 0.00% Impervious, Inflow Depth = 0.99" for 100-Year event
Inflow = 0.80 cfs @ 12.32 hrs, Volume= 0.132 af
Outflow = 0.80 cfs @ 12.32 hrs, Volume= 0.132 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.10-30.00 hrs, dt= 0.05 hrs

Reach 3R: (new Reach)



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Type III 24-hr 100-Year Rainfall=8.52"

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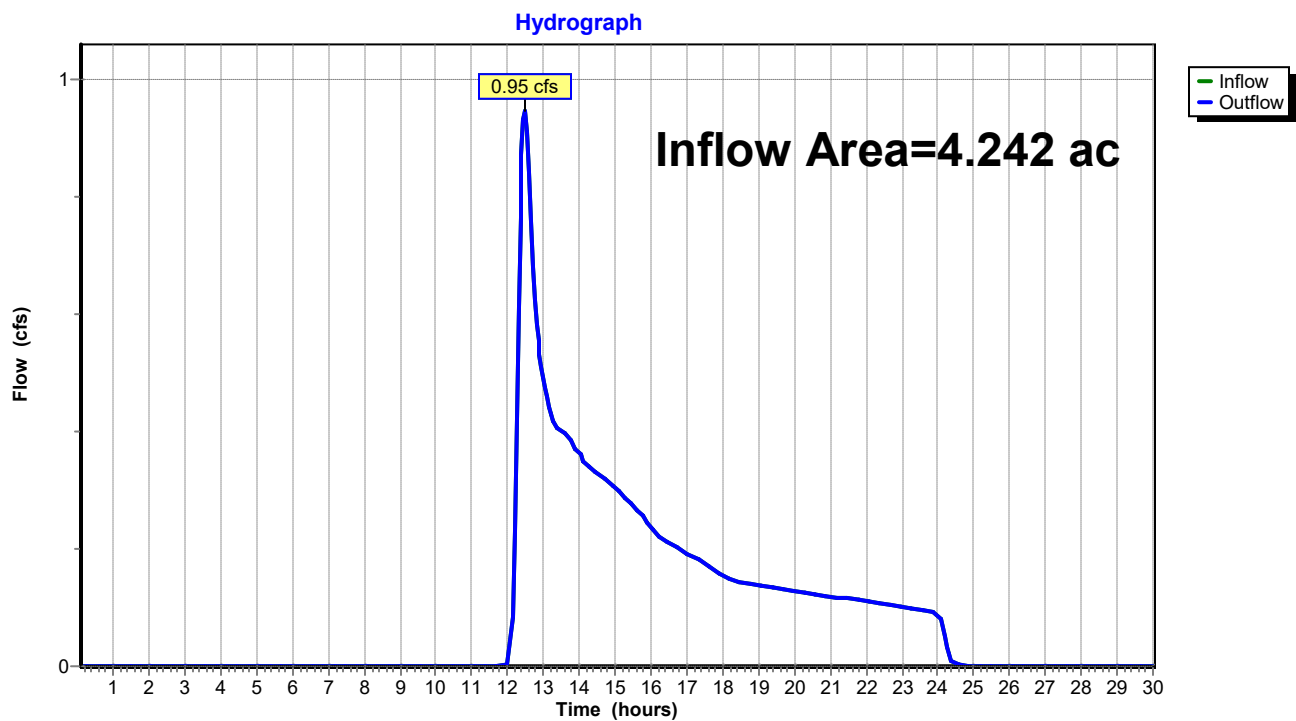
Summary for Reach 4R: (new Reach)

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 4.242 ac, 0.00% Impervious, Inflow Depth = 0.63" for 100-Year event
Inflow = 0.95 cfs @ 12.49 hrs, Volume= 0.222 af
Outflow = 0.95 cfs @ 12.49 hrs, Volume= 0.222 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.10-30.00 hrs, dt= 0.05 hrs

Reach 4R: (new Reach)



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Type III 24-hr 100-Year Rainfall=8.52"

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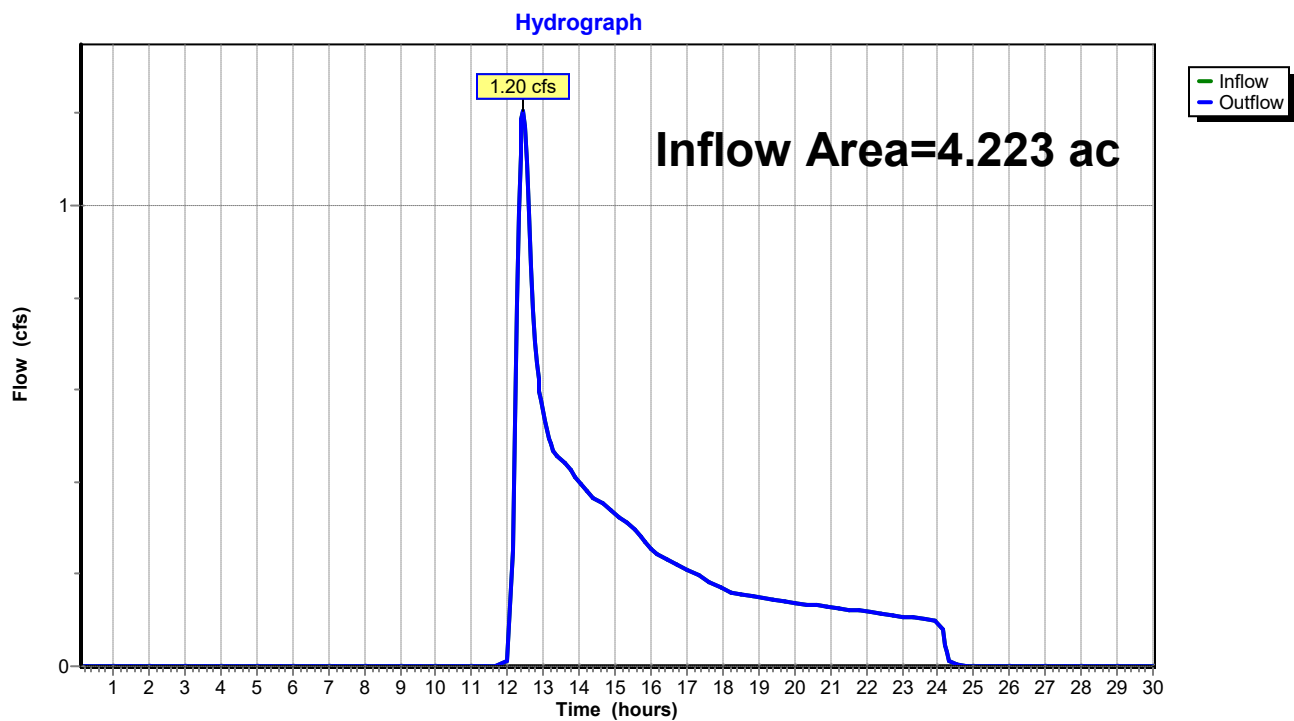
Summary for Reach 5R: (new Reach)

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 4.223 ac, 0.00% Impervious, Inflow Depth = 0.71" for 100-Year event
Inflow = 1.20 cfs @ 12.44 hrs, Volume= 0.251 af
Outflow = 1.20 cfs @ 12.44 hrs, Volume= 0.251 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.10-30.00 hrs, dt= 0.05 hrs

Reach 5R: (new Reach)



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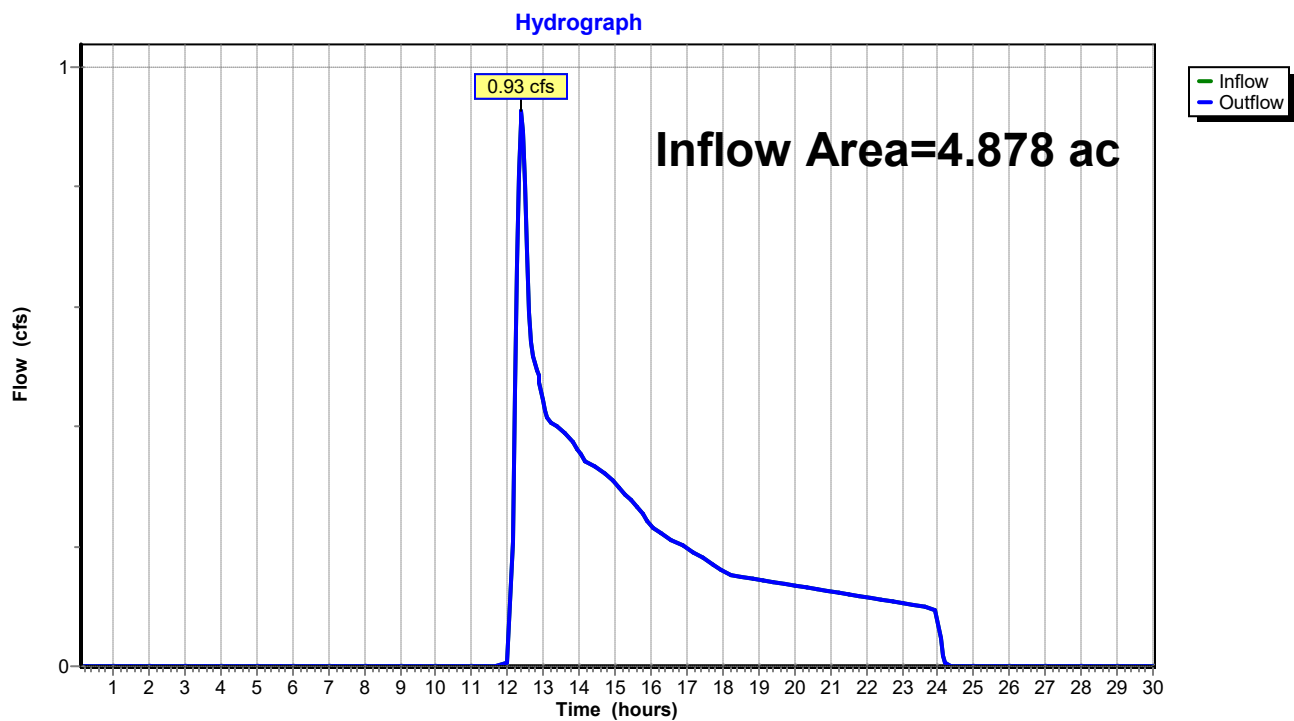
Summary for Reach 6R: (new Reach)

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 4.878 ac, 0.00% Impervious, Inflow Depth = 0.55" for 100-Year event
Inflow = 0.93 cfs @ 12.39 hrs, Volume= 0.222 af
Outflow = 0.93 cfs @ 12.39 hrs, Volume= 0.222 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.10-30.00 hrs, dt= 0.05 hrs

Reach 6R: (new Reach)



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- 3 Area Listing (all nodes)
- 4 Soil Listing (all nodes)
- 5 Ground Covers (all nodes)

2-Year Event

- 6 Node Listing
- 7 Subcat 1S: PRE AREA A1
- 9 Subcat 2S: PRE AREA A2
- 11 Subcat 3S: PRE AREA A3
- 13 Subcat 4S: PRE AREA C1
- 14 Subcat 5S: PRE AREA C2
- 15 Subcat 6S: PRE AREA C3
- 16 Reach 1R: (new Reach)
- 17 Reach 2R: (new Reach)
- 18 Reach 3R: (new Reach)
- 19 Reach 4R: (new Reach)
- 20 Reach 5R: (new Reach)
- 21 Reach 6R: (new Reach)

10-Year Event

- 22 Node Listing
- 23 Subcat 1S: PRE AREA A1
- 24 Subcat 2S: PRE AREA A2
- 26 Subcat 3S: PRE AREA A3
- 27 Subcat 4S: PRE AREA C1
- 28 Subcat 5S: PRE AREA C2
- 29 Subcat 6S: PRE AREA C3
- 30 Reach 1R: (new Reach)
- 31 Reach 2R: (new Reach)
- 32 Reach 3R: (new Reach)
- 33 Reach 4R: (new Reach)
- 34 Reach 5R: (new Reach)
- 35 Reach 6R: (new Reach)

100-Year Event

- 36 Node Listing
- 37 Subcat 1S: PRE AREA A1
- 38 Subcat 2S: PRE AREA A2
- 40 Subcat 3S: PRE AREA A3
- 41 Subcat 4S: PRE AREA C1
- 42 Subcat 5S: PRE AREA C2
- 43 Subcat 6S: PRE AREA C3
- 44 Reach 1R: (new Reach)

PRE CONDITIONS CHIPAWAY

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- 45 Reach 2R: (new Reach)
- 46 Reach 3R: (new Reach)
- 47 Reach 4R: (new Reach)
- 48 Reach 5R: (new Reach)
- 49 Reach 6R: (new Reach)

PRE CONDITIONS CHIPAWAY

Type III 24-hr 100-Year Rainfall=8.52"

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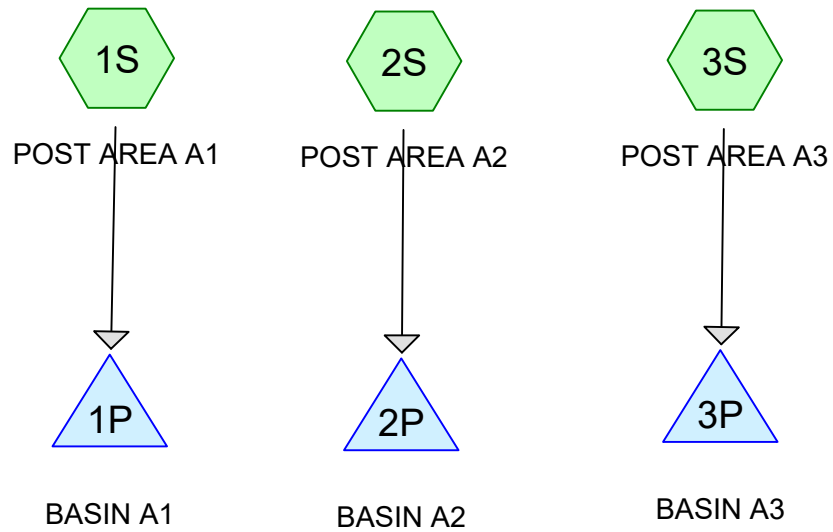
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Current Messages

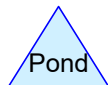
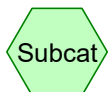
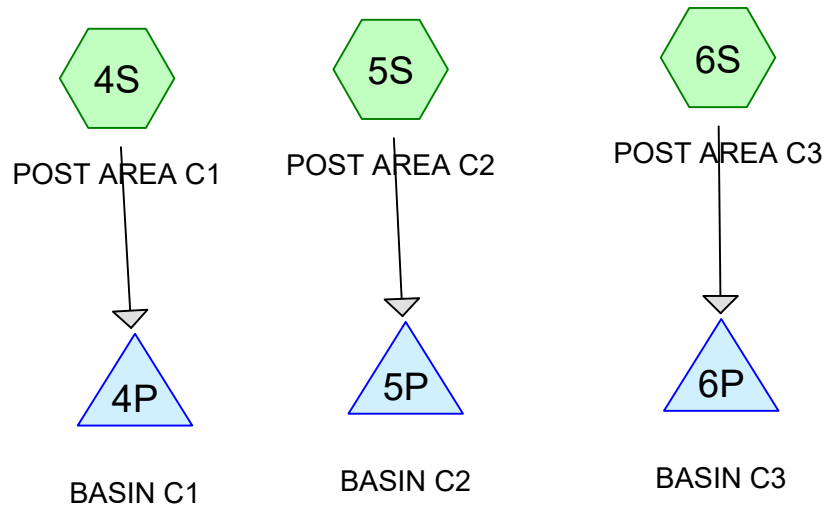
- [13] Note: Time span=0.10-30.00 hrs, dt=0.05 hrs, 599 points
- [16] Note: Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
- [19] Note: Type III 24-hr 100-Year Rainfall=8.52"
- [22] Note: Reach routing by Dyn-Stor-Ind method
- [25] Note: Pond routing by Dyn-Stor-Ind method
- [28] Note: Updating Subcat 1S: PRE AREA A1
- [28] Note: Updating Subcat 2S: PRE AREA A2
- [28] Note: Updating Subcat 3S: PRE AREA A3
- [28] Note: Updating Subcat 4S: PRE AREA C1
- [28] Note: Updating Subcat 5S: PRE AREA C2
- [28] Note: Updating Subcat 6S: PRE AREA C3
- [28] Note: Updating Reach 1R: (new Reach)
- [40] Hint: Reach 1R Not Described (Outflow=Inflow)
- [28] Note: Updating Reach 2R: (new Reach)
- [40] Hint: Reach 2R Not Described (Outflow=Inflow)
- [28] Note: Updating Reach 3R: (new Reach)
- [40] Hint: Reach 3R Not Described (Outflow=Inflow)
- [28] Note: Updating Reach 4R: (new Reach)
- [40] Hint: Reach 4R Not Described (Outflow=Inflow)
- [28] Note: Updating Reach 5R: (new Reach)
- [40] Hint: Reach 5R Not Described (Outflow=Inflow)
- [28] Note: Updating Reach 6R: (new Reach)
- [40] Hint: Reach 6R Not Described (Outflow=Inflow)
- [28] Note: Updating Text 9T: PV ARRAY AREA "A"
- [28] Note: Updating Text 13T: PV ARRAY AREA "C"

**Post Development Conditions Analysis Data
For Solar Farm
Off Chipaway Road (Map 247 Lot 5 & Map 252 Lot 1)
Freetown, MA**

PV ARRAY AREA "A"



PV ARRAY AREA "C"



POST CONDITIONS CHIPAWAY

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Rainfall Events Listing

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2-Year	Type III 24-hr		Default	24.00	1	3.31	2
2	10-Year	Type III 24-hr		Default	24.00	1	4.88	2
3	100-Year	Type III 24-hr		Default	24.00	1	8.52	2

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Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
21.452	39	>75% Grass cover, Good, HSG A (1S, 2S, 3S, 4S, 5S, 6S)
1.686	96	Gravel surface, HSG A (1S, 2S, 3S, 4S, 5S, 6S)
0.001	98	PANEL SUPPORT POSTS (3S)
0.007	98	PANEL SUPPORTS (1S, 2S)
0.012	98	SOLAR SUPPORTS (4S, 5S, 6S)
0.086	98	TRANSFORMER PAD (1S, 4S, 5S)
0.000	98	UTILITY POLE (1S)
0.000	98	UTILITY POLES (4S, 6S)
23.244	43	TOTAL AREA

POST CONDITIONS CHIPAWAY

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Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
23.138	HSG A	1S, 2S, 3S, 4S, 5S, 6S
0.000	HSG B	
0.000	HSG C	
0.000	HSG D	
0.106	Other	1S, 2S, 3S, 4S, 5S, 6S
23.244		TOTAL AREA

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Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
21.452	0.000	0.000	0.000	0.000	21.452	>75% Grass cover, Good	1S, 2S, 3S, 4S, 5S, 6S
1.686	0.000	0.000	0.000	0.000	1.686	Gravel surface	1S, 2S, 3S, 4S, 5S, 6S
0.000	0.000	0.000	0.000	0.001	0.001	PANEL SUPPORT POSTS	3S
0.000	0.000	0.000	0.000	0.007	0.007	PANEL SUPPORTS	1S, 2S
0.000	0.000	0.000	0.000	0.012	0.012	SOLAR SUPPORTS	4S, 5S, 6S
0.000	0.000	0.000	0.000	0.086	0.086	TRANSFORMER PAD	1S, 4S, 5S
0.000	0.000	0.000	0.000	0.000	0.000	UTILITY POLE	1S
0.000	0.000	0.000	0.000	0.000	0.000	UTILITY POLES	4S, 6S
23.138	0.000	0.000	0.000	0.106	23.244	TOTAL AREA	

POST CONDITIONS CHIPAWAY*Type III 24-hr 2-Year Rainfall=3.31"*

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Time span=0.10-36.00 hrs, dt=0.05 hrs, 719 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

Subcatchment 1S: POST AREA A1	Runoff Area=62,707 sf 2.05% Impervious Runoff Depth=0.09" Tc=6.0 min CN=47 Runoff=0.02 cfs 0.011 af
Subcatchment 2S: POST AREA A2	Runoff Area=299,064 sf 0.09% Impervious Runoff Depth=0.04" Flow Length=507' Tc=11.7 min CN=44 Runoff=0.04 cfs 0.025 af
Subcatchment 3S: POST AREA A3	Runoff Area=69,526 sf 0.08% Impervious Runoff Depth=0.07" Tc=6.0 min CN=46 Runoff=0.02 cfs 0.010 af
Subcatchment 4S: POST AREA C1	Runoff Area=184,766 sf 0.76% Impervious Runoff Depth=0.03" Flow Length=347' Tc=7.2 min CN=43 Runoff=0.02 cfs 0.011 af
Subcatchment 5S: POST AREA C2	Runoff Area=183,945 sf 0.76% Impervious Runoff Depth=0.03" Tc=6.0 min CN=43 Runoff=0.02 cfs 0.011 af
Subcatchment 6S: POST AREA C3	Runoff Area=212,498 sf 0.10% Impervious Runoff Depth=0.02" Flow Length=228' Tc=6.1 min CN=42 Runoff=0.01 cfs 0.009 af
Pond 1P: BASIN A1	Peak Elev=93.90' Storage=3 cf Inflow=0.02 cfs 0.011 af Discarded=0.02 cfs 0.011 af Primary=0.00 cfs 0.000 af Outflow=0.02 cfs 0.011 af
Pond 2P: BASIN A2	Peak Elev=92.40' Storage=7 cf Inflow=0.04 cfs 0.025 af Discarded=0.04 cfs 0.025 af Primary=0.00 cfs 0.000 af Outflow=0.04 cfs 0.025 af
Pond 3P: BASIN A3	Peak Elev=94.80' Storage=15 cf Inflow=0.02 cfs 0.010 af Discarded=0.02 cfs 0.010 af Primary=0.00 cfs 0.000 af Outflow=0.02 cfs 0.010 af
Pond 4P: BASIN C1	Peak Elev=92.50' Storage=3 cf Inflow=0.02 cfs 0.011 af Discarded=0.02 cfs 0.011 af Primary=0.00 cfs 0.000 af Outflow=0.02 cfs 0.011 af
Pond 5P: BASIN C2	Peak Elev=95.80' Storage=3 cf Inflow=0.02 cfs 0.011 af Discarded=0.02 cfs 0.011 af Primary=0.00 cfs 0.000 af Outflow=0.02 cfs 0.011 af
Pond 6P: BASIN C3	Peak Elev=94.80' Storage=3 cf Inflow=0.01 cfs 0.009 af Discarded=0.01 cfs 0.009 af Primary=0.00 cfs 0.000 af Outflow=0.01 cfs 0.009 af
Total Runoff Area = 23.244 ac Runoff Volume = 0.076 af Average Runoff Depth = 0.04" 99.54% Pervious = 23.138 ac 0.46% Impervious = 0.106 ac	

POST CONDITIONS CHIPAWAY

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Type III 24-hr 2-Year Rainfall=3.31"

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Summary for Subcatchment 1S: POST AREA A1

IMPERVIOUS AREA PER PANEL TABLE IS 0.698 S.F.

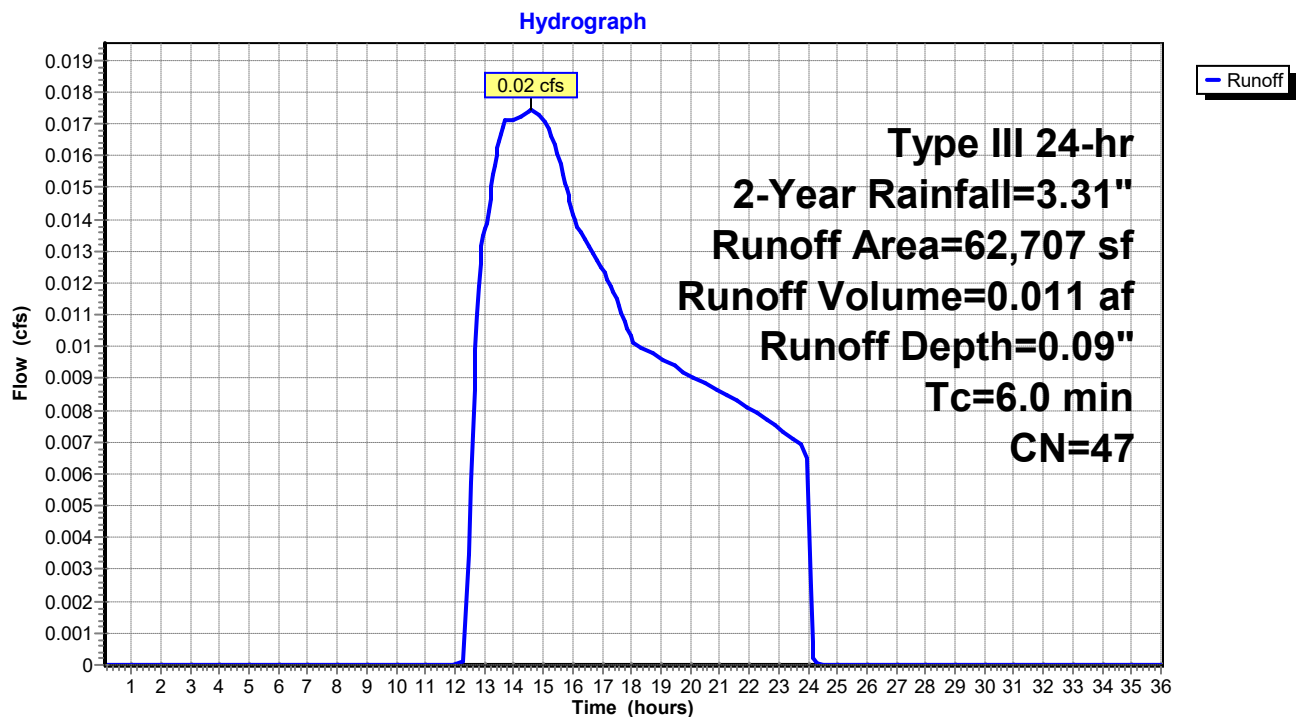
52 PANEL TABLES X 0.698 = 36.3 S.F.

Runoff = 0.02 cfs @ 14.59 hrs, Volume= 0.011 af, Depth= 0.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.10-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.31"

Area (sf)	CN	Description
53,540	39	>75% Grass cover, Good, HSG A
7,880	96	Gravel surface, HSG A
* 36	98	PANEL SUPPORTS
* 1,250	98	TRANSFORMER PAD
* 1	98	UTILITY POLE
62,707	47	Weighted Average
61,420		97.95% Pervious Area
1,287		2.05% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment 1S: POST AREA A1

POST CONDITIONS CHIPAWAY

Type III 24-hr 2-Year Rainfall=3.31"

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Summary for Subcatchment 2S: POST AREA A2

4-INCH OD ROUND STEEL PANEL SUPPORTS. EIGHT SUPPORTS PER PANEL TABLE.
IMPERVIOUS AREA PER PANEL TABLE IS 0.698 S.F.

373 PANEL GROUPS X 0.698 S.F = 260.3 S.F.

Runoff = 0.04 cfs @ 15.49 hrs, Volume= 0.025 af, Depth= 0.04"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.10-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.31"

Area (sf)	CN	Description
273,954	39	>75% Grass cover, Good, HSG A
* 260	98	PANEL SUPPORTS
24,850	96	Gravel surface, HSG A
299,064	44	Weighted Average
298,804		99.91% Pervious Area
260		0.09% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.1	258	0.0100	0.70		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
1.8	89	0.0140	0.83		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
3.8	160	0.0100	0.70		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
11.7	507	Total			

POST CONDITIONS CHIPAWAY

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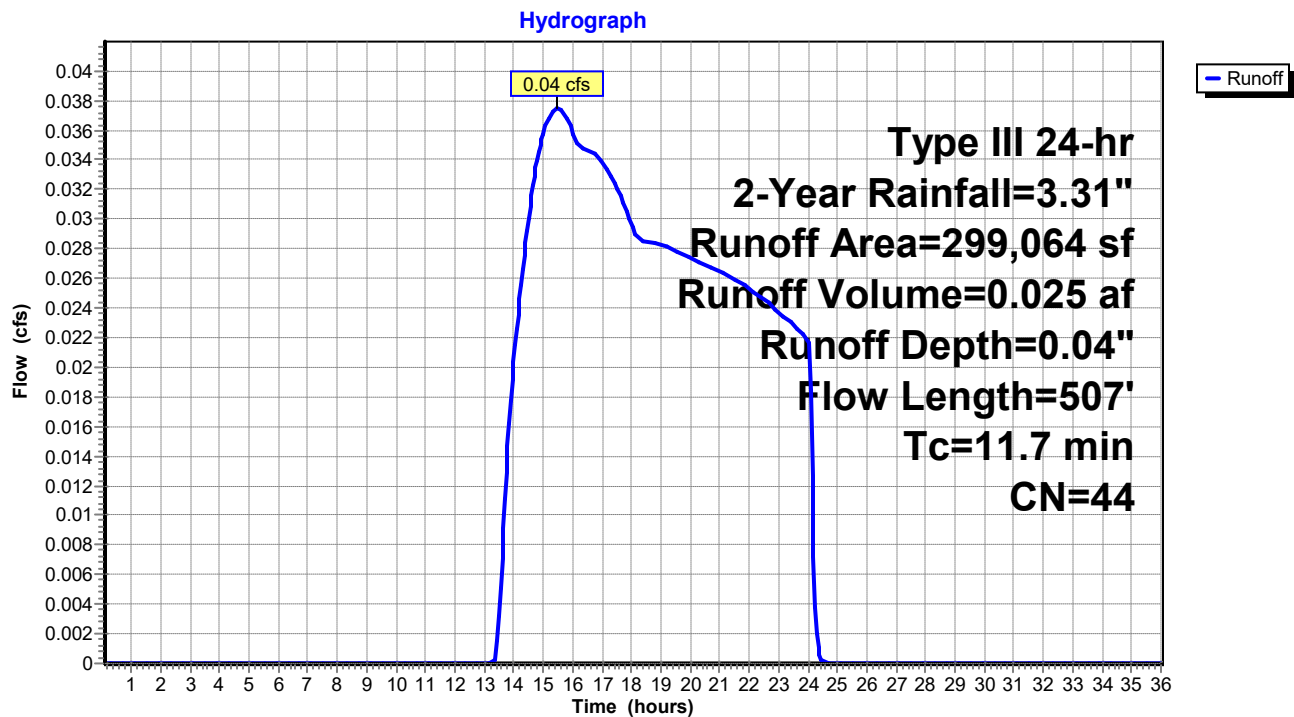
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Type III 24-hr 2-Year Rainfall=3.31"

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Subcatchment 2S: POST AREA A2



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Type III 24-hr 2-Year Rainfall=3.31"

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Summary for Subcatchment 3S: POST AREA A3

4-INCH OD ROUND STEEL PANEL SUPPORTS. EIGHT SUPPORTS PER PANEL TABLE.

IMPERVIOUS AREA PER PANEL TABLE IS 0.698 S.F.

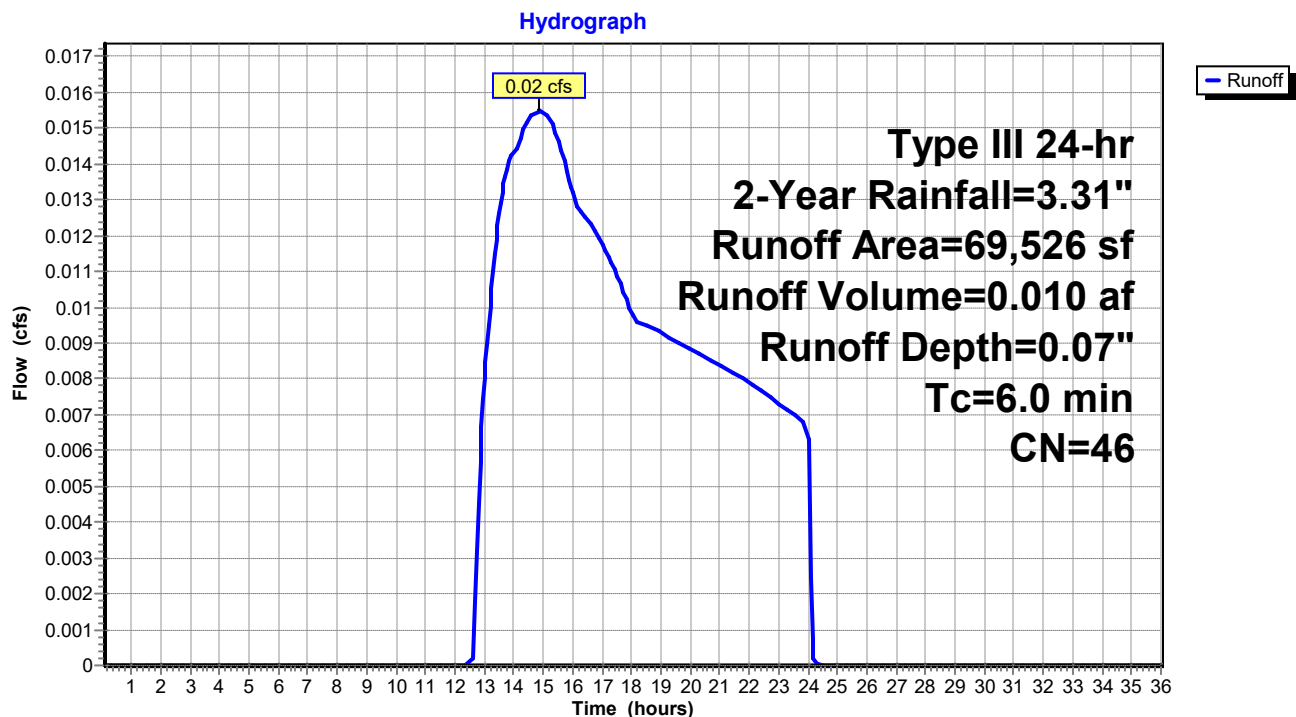
85 PANEL GROUPS X 0.698 S.F = 59.3 S.F.

Runoff = 0.02 cfs @ 14.83 hrs, Volume= 0.010 af, Depth= 0.07"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.10-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.31"

Area (sf)	CN	Description
61,037	39	>75% Grass cover, Good, HSG A
8,430	96	Gravel surface, HSG A
* 59	98	PANEL SUPPORT POSTS
69,526	46	Weighted Average
69,467		99.92% Pervious Area
59		0.08% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment 3S: POST AREA A3

POST CONDITIONS CHIPAWAY

Type III 24-hr 2-Year Rainfall=3.31"

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Summary for Subcatchment 4S: POST AREA C1

4-INCH OD ROUND STEEL PANEL SUPPORTS. EIGHT SUPPORTS PER PANEL TABLE.
IMPERVIOUS AREA PER PANEL TABLE IS 0.698 S.F.

UTILITY POLE AREA 10 INCH ROUND IS 0.55 S.F.

Runoff = 0.02 cfs @ 16.75 hrs, Volume= 0.011 af, Depth= 0.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.10-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.31"

	Area (sf)	CN	Description
	171,317	39	>75% Grass cover, Good, HSG A
*	145	98	SOLAR SUPPORTS
	12,050	96	Gravel surface, HSG A
*	1,250	98	TRANSFORMER PAD
*	4	98	UTILITY POLES
	184,766	43	Weighted Average
	183,367		99.24% Pervious Area
	1,399		0.76% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.1	119	0.0180	0.94		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
4.2	147	0.0070	0.59		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.9	81	0.0430	1.45		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
7.2	347	Total			

POST CONDITIONS CHIPAWAY

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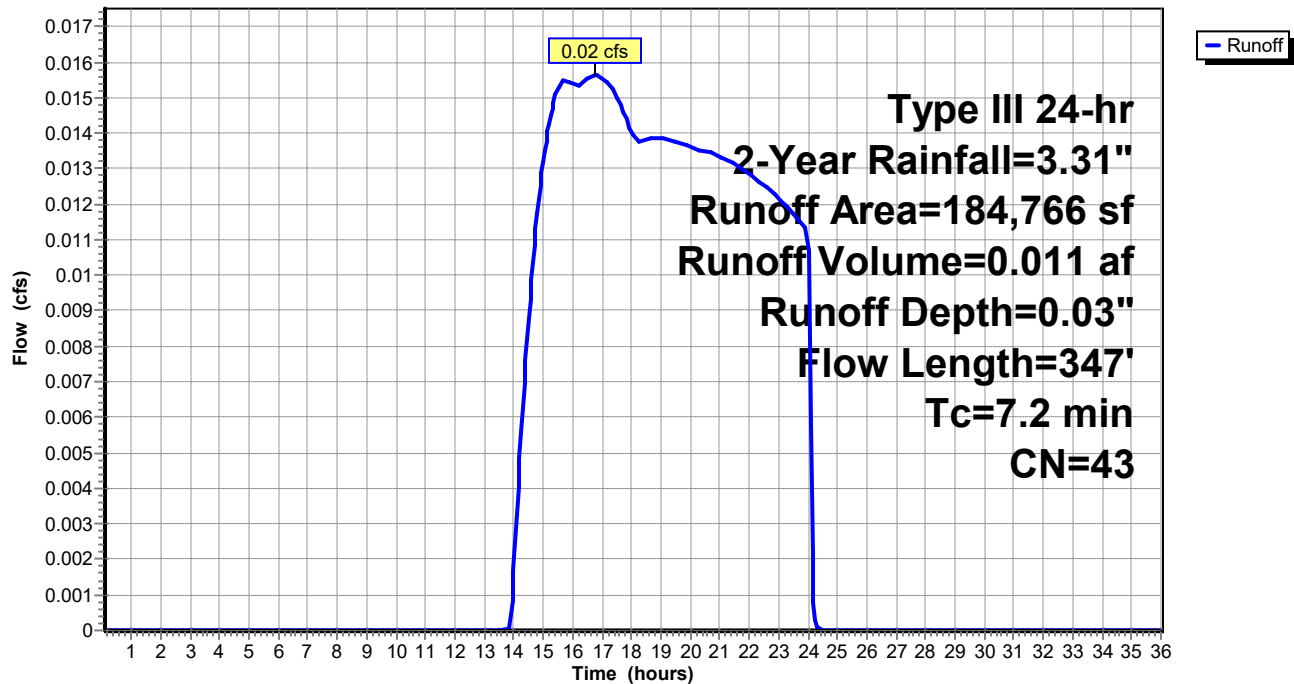
Type III 24-hr 2-Year Rainfall=3.31"

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Subcatchment 4S: POST AREA C1

Hydrograph



POST CONDITIONS CHIPAWAY

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Type III 24-hr 2-Year Rainfall=3.31"

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Summary for Subcatchment 5S: POST AREA C2

4-INCH OD ROUND STEEL PANEL SUPPORTS. EIGHT SUPPORTS PER PANEL TABLE.
IMPERVIOUS AREA PER PANEL TABLE IS 0.698 S.F.

Runoff = 0.02 cfs @ 16.73 hrs, Volume= 0.011 af, Depth= 0.03"

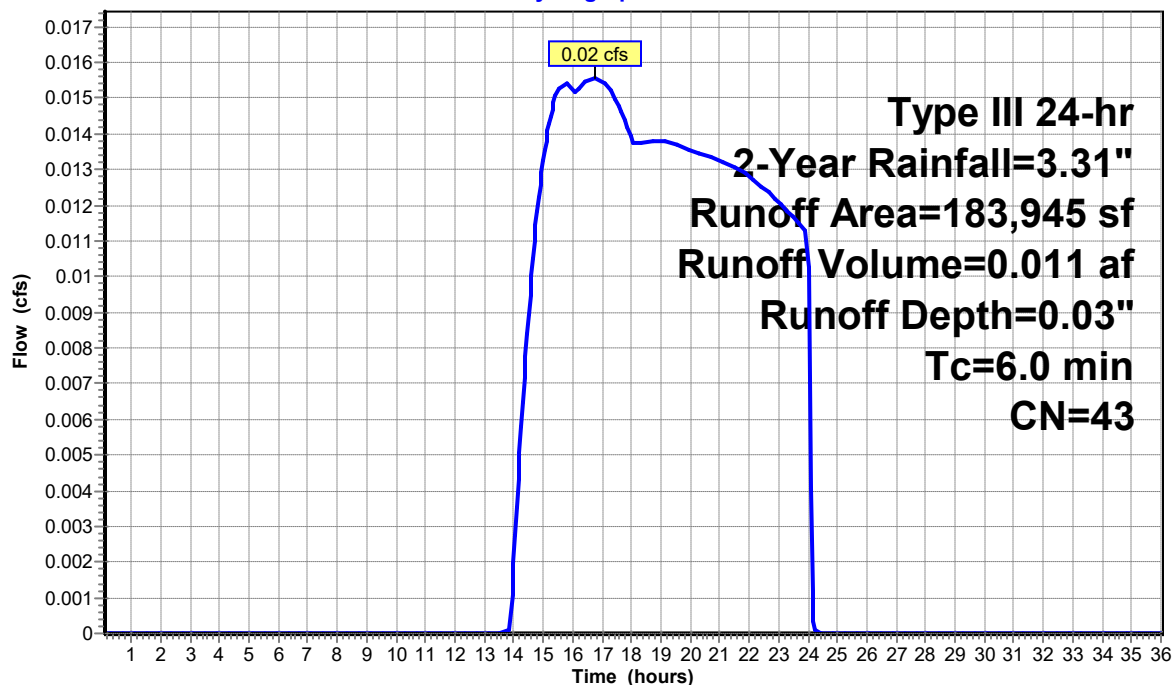
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.10-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.31"

	Area (sf)	CN	Description
	171,846	39	>75% Grass cover, Good, HSG A
*	149	98	SOLAR SUPPORTS
*	1,250	98	TRANSFORMER PAD
	10,700	96	Gravel surface, HSG A
	183,945	43	Weighted Average
	182,546		99.24% Pervious Area
	1,399		0.76% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment 5S: POST AREA C2

Hydrograph



POST CONDITIONS CHIPAWAY

Type III 24-hr 2-Year Rainfall=3.31"

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Summary for Subcatchment 6S: POST AREA C3

4-INCH OD ROUND STEEL PANEL SUPPORTS. EIGHT SUPPORTS PER PANEL TABLE.
IMPERVIOUS AREA PER PANEL TABLE IS 0.698 S.F.

10 INCH DIA UTILITY POLE A = 0.55S.F.

Runoff = 0.01 cfs @ 17.28 hrs, Volume= 0.009 af, Depth= 0.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.10-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.31"

Area (sf)	CN	Description
202,735	39	>75% Grass cover, Good, HSG A
* 210	98	SOLAR SUPPORTS
9,550	96	Gravel surface, HSG A
* 3	98	UTILITY POLES
212,498	42	Weighted Average
212,285		99.90% Pervious Area
213		0.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.5	15	0.0130	0.10		Sheet Flow, Grass: Short n= 0.150 P2= 3.31"
0.6	28	0.0130	0.80		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
1.5	91	0.0220	1.04		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
1.5	94	0.0220	1.04		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
6.1	228	Total			

POST CONDITIONS CHIPAWAY

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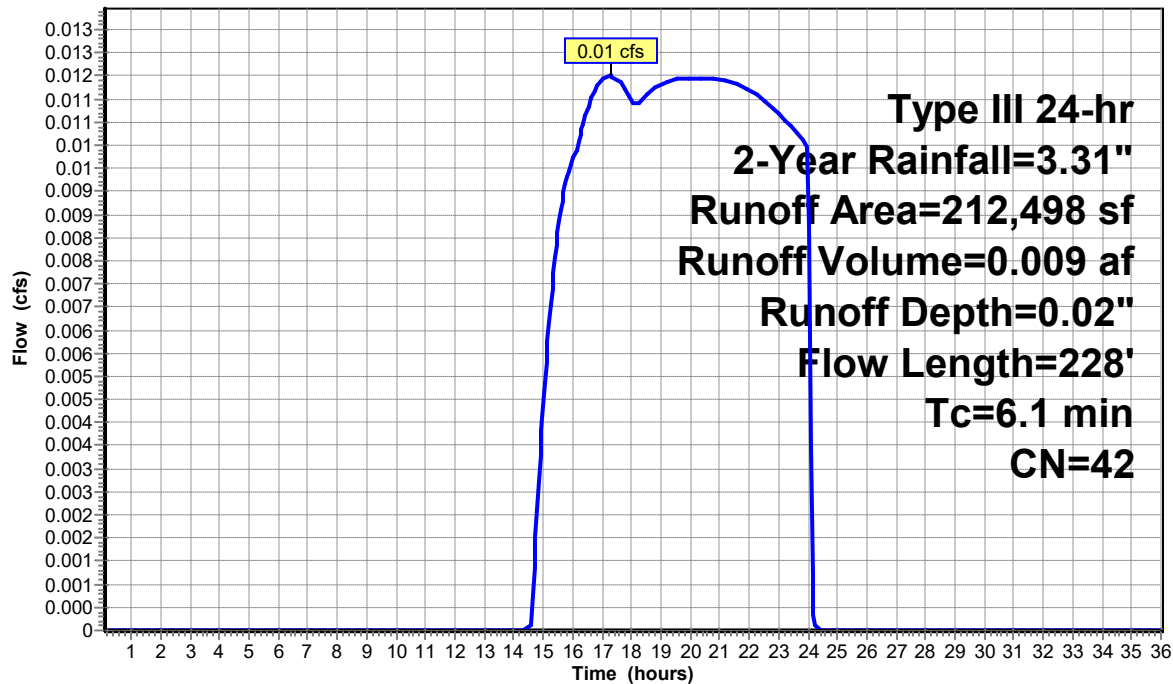
Type III 24-hr 2-Year Rainfall=3.31"

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Subcatchment 6S: POST AREA C3

Hydrograph



POST CONDITIONS CHIPAWAY

Type III 24-hr 2-Year Rainfall=3.31"

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Summary for Pond 1P: BASIN A1

Inflow Area = 1.440 ac, 2.05% Impervious, Inflow Depth = 0.09" for 2-Year event
 Inflow = 0.02 cfs @ 14.59 hrs, Volume= 0.011 af
 Outflow = 0.02 cfs @ 14.64 hrs, Volume= 0.011 af, Atten= 0%, Lag= 3.2 min
 Discarded = 0.02 cfs @ 14.64 hrs, Volume= 0.011 af
 Primary = 0.00 cfs @ 0.10 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.10-36.00 hrs, dt= 0.05 hrs
 Peak Elev= 93.90' @ 14.64 hrs Surf.Area= 30,902 sf Storage= 3 cf

Plug-Flow detention time= 3.3 min calculated for 0.011 af (100% of inflow)
 Center-of-Mass det. time= 3.3 min (1,047.7 - 1,044.4)

Volume	Invert	Avail.Storage	Storage Description
#1	93.90'	38,781 cf	BASIN A1 (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
93.90	30,901	704.0	0	0	30,901
95.00	39,797	779.0	38,781	38,781	39,790

Device	Routing	Invert	Outlet Devices
#1	Discarded	93.90'	2.410 in/hr Exfiltration over Surface area
#2	Primary	94.99'	12.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=1.72 cfs @ 14.64 hrs HW=93.90' (Free Discharge)
 ↑ **1=Exfiltration** (Exfiltration Controls 1.72 cfs)

Primary OutFlow Max=0.00 cfs @ 0.10 hrs HW=93.90' (Free Discharge)
 ↑ **2=Orifice/Grate** (Controls 0.00 cfs)

POST CONDITIONS CHIPAWAY

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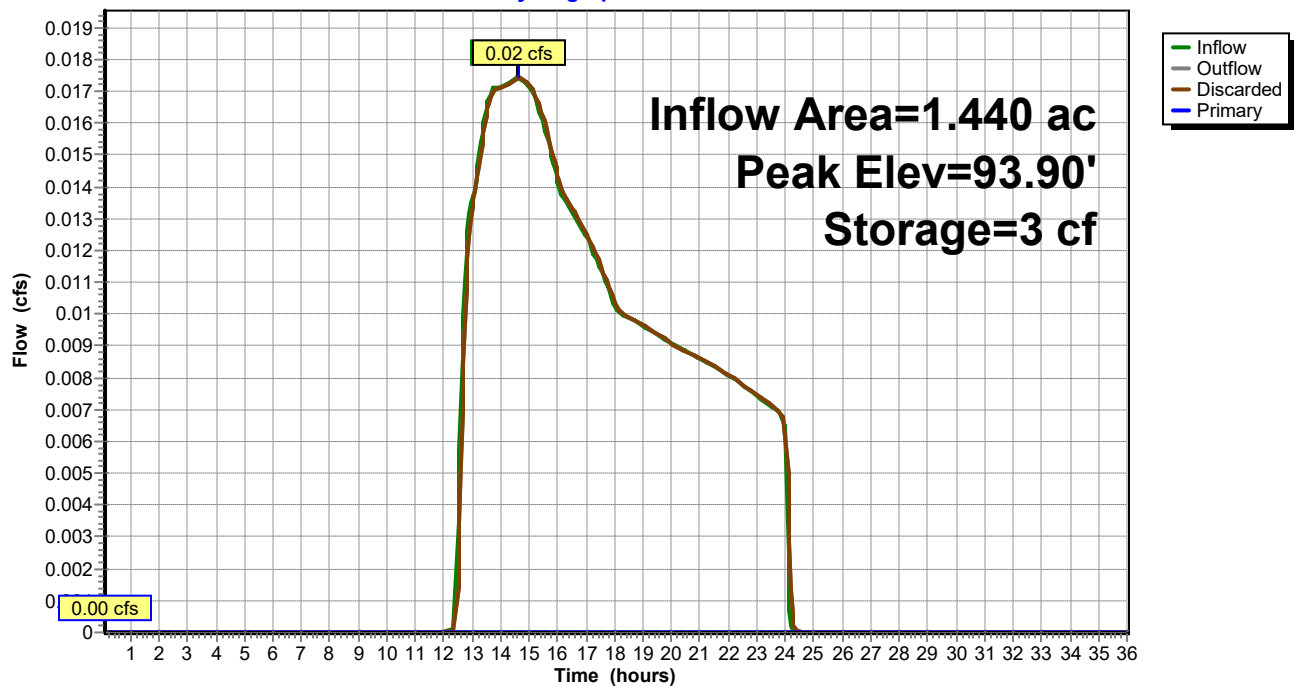
Type III 24-hr 2-Year Rainfall=3.31"

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Pond 1P: BASIN A1

Hydrograph



POST CONDITIONS CHIPAWAY

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Summary for Pond 2P: BASIN A2

Inflow Area = 6.866 ac, 0.09% Impervious, Inflow Depth = 0.04" for 2-Year event
 Inflow = 0.04 cfs @ 15.49 hrs, Volume= 0.025 af
 Outflow = 0.04 cfs @ 15.55 hrs, Volume= 0.025 af, Atten= 0%, Lag= 3.3 min
 Discarded = 0.04 cfs @ 15.55 hrs, Volume= 0.025 af
 Primary = 0.00 cfs @ 0.10 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.10-36.00 hrs, dt= 0.05 hrs
 Peak Elev= 92.40' @ 15.55 hrs Surf.Area= 77,694 sf Storage= 7 cf

Plug-Flow detention time= 3.3 min calculated for 0.025 af (100% of inflow)
 Center-of-Mass det. time= 3.3 min (1,120.1 - 1,116.8)

Volume	Invert	Avail.Storage	Storage Description
#1	92.40'	97,201 cf	BASIN A2 (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
92.40	77,692	1,788.0	0	0	77,692
93.50	99,485	1,864.0	97,201	97,201	99,870

Device	Routing	Invert	Outlet Devices
#1	Discarded	92.40'	2.410 in/hr Exfiltration over Surface area
#2	Primary	93.49'	12.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=4.33 cfs @ 15.55 hrs HW=92.40' (Free Discharge)
 ↑1=Exfiltration (Exfiltration Controls 4.33 cfs)

Primary OutFlow Max=0.00 cfs @ 0.10 hrs HW=92.40' (Free Discharge)
 ↑2=Orifice/Grate (Controls 0.00 cfs)

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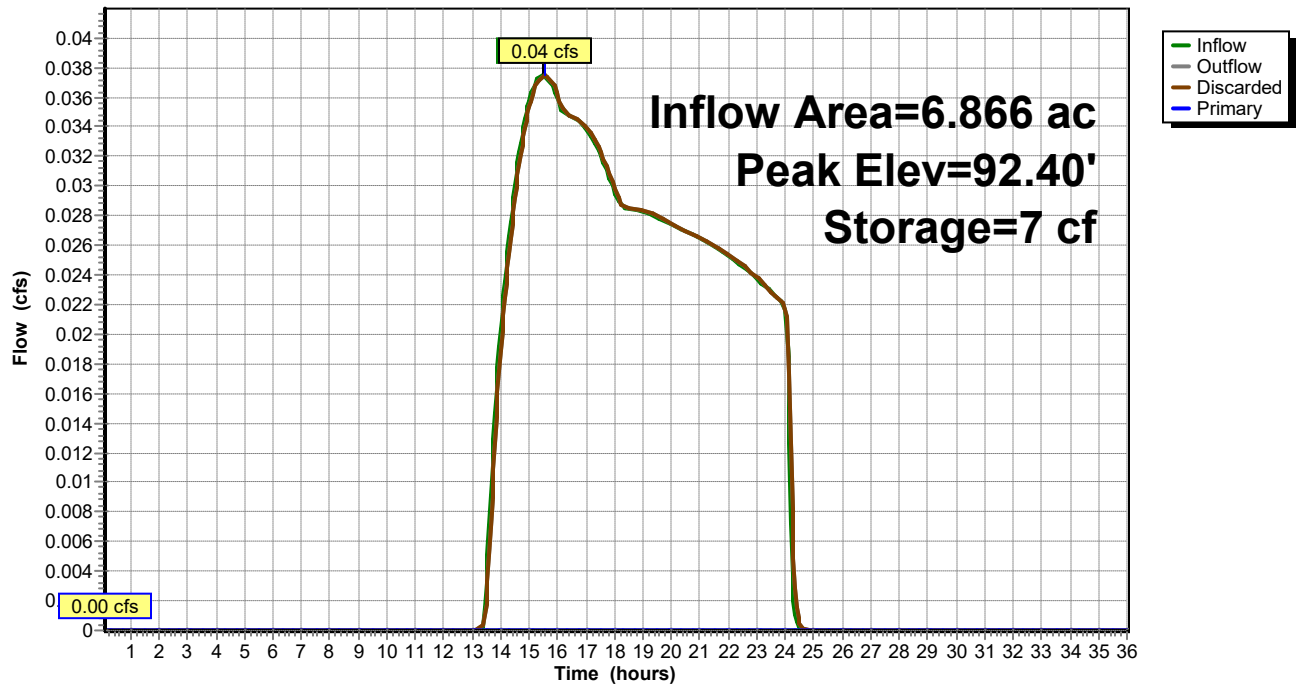
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Pond 2P: BASIN A2

Hydrograph



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Summary for Pond 3P: BASIN A3

Inflow Area = 1.596 ac, 0.08% Impervious, Inflow Depth = 0.07" for 2-Year event
 Inflow = 0.02 cfs @ 14.83 hrs, Volume= 0.010 af
 Outflow = 0.02 cfs @ 15.11 hrs, Volume= 0.010 af, Atten= 1%, Lag= 16.8 min
 Discarded = 0.02 cfs @ 15.11 hrs, Volume= 0.010 af
 Primary = 0.00 cfs @ 0.10 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.10-36.00 hrs, dt= 0.05 hrs
 Peak Elev= 94.80' @ 15.11 hrs Surf.Area= 23,898 sf Storage= 15 cf

Plug-Flow detention time= 16.5 min calculated for 0.010 af (100% of inflow)
 Center-of-Mass det. time= 16.6 min (1,080.4 - 1,063.8)

Volume	Invert	Avail.Storage	Storage Description
#1	94.80'	33,179 cf	BASIN A3 (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
94.80	23,894	603.0	0	0	23,894
96.00	31,582	678.0	33,179	33,179	31,578

Device	Routing	Invert	Outlet Devices
#1	Discarded	94.80'	0.520 in/hr Exfiltration over Surface area
#2	Primary	95.99'	12.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.29 cfs @ 15.11 hrs HW=94.80' (Free Discharge)
 ↑1=Exfiltration (Exfiltration Controls 0.29 cfs)

Primary OutFlow Max=0.00 cfs @ 0.10 hrs HW=94.80' (Free Discharge)
 ↑2=Orifice/Grate (Controls 0.00 cfs)

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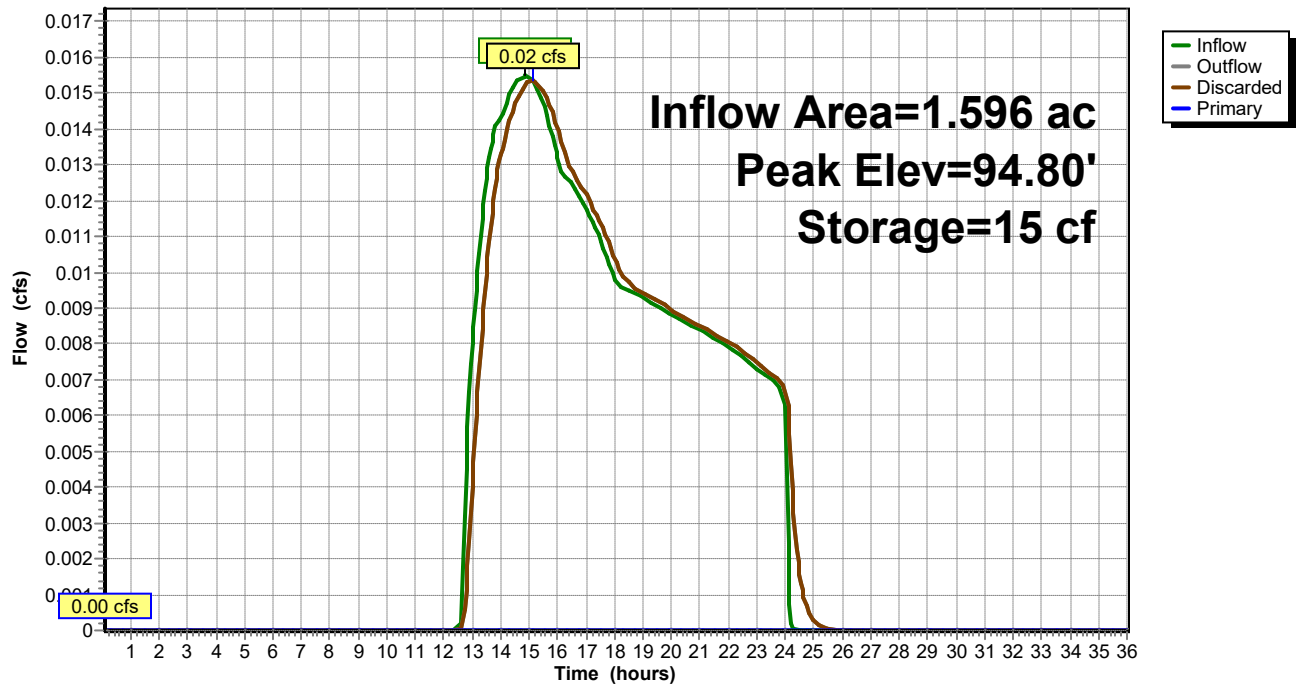
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Pond 3P: BASIN A3

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Summary for Pond 4P: BASIN C1

Inflow Area = 4.242 ac, 0.76% Impervious, Inflow Depth = 0.03" for 2-Year event
 Inflow = 0.02 cfs @ 16.75 hrs, Volume= 0.011 af
 Outflow = 0.02 cfs @ 16.81 hrs, Volume= 0.011 af, Atten= 0%, Lag= 3.6 min
 Discarded = 0.02 cfs @ 16.81 hrs, Volume= 0.011 af
 Primary = 0.00 cfs @ 0.10 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.10-36.00 hrs, dt= 0.05 hrs

Peak Elev= 92.50' @ 16.81 hrs Surf.Area= 32,984 sf Storage= 3 cf

Plug-Flow detention time= 3.6 min calculated for 0.011 af (100% of inflow)

Center-of-Mass det. time= 3.6 min (1,146.0 - 1,142.4)

Volume	Invert	Avail.Storage	Storage Description
#1	92.50'	46,528 cf	BASIN C1 (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
92.50	32,983	1,458.0	0	0	32,983
93.70	44,867	1,512.0	46,528	46,528	45,869

Device	Routing	Invert	Outlet Devices
#1	Discarded	92.50'	2.410 in/hr Exfiltration over Surface area
#2	Primary	93.69'	6.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=1.84 cfs @ 16.81 hrs HW=92.50' (Free Discharge)↑ **1=Exfiltration** (Exfiltration Controls 1.84 cfs)**Primary OutFlow** Max=0.00 cfs @ 0.10 hrs HW=92.50' (Free Discharge)↑ **2=Orifice/Grate** (Controls 0.00 cfs)

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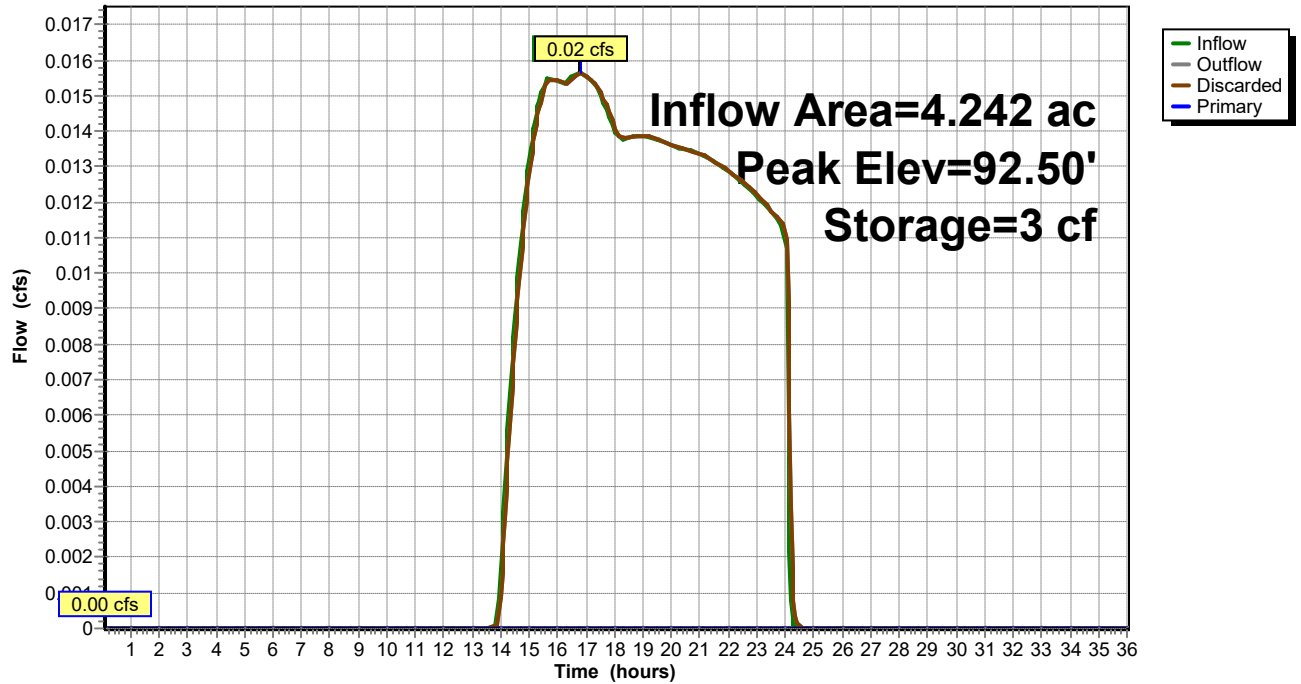
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Pond 4P: BASIN C1

Hydrograph



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Summary for Pond 5P: BASIN C2

Inflow Area = 4.223 ac, 0.76% Impervious, Inflow Depth = 0.03" for 2-Year event
 Inflow = 0.02 cfs @ 16.73 hrs, Volume= 0.011 af
 Outflow = 0.02 cfs @ 16.79 hrs, Volume= 0.011 af, Atten= 0%, Lag= 3.4 min
 Discarded = 0.02 cfs @ 16.79 hrs, Volume= 0.011 af
 Primary = 0.00 cfs @ 0.10 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.10-36.00 hrs, dt= 0.05 hrs
 Peak Elev= 95.80' @ 16.79 hrs Surf.Area= 46,908 sf Storage= 3 cf

Plug-Flow detention time= 3.6 min calculated for 0.011 af (100% of inflow)
 Center-of-Mass det. time= 3.6 min (1,144.9 - 1,141.3)

Volume	Invert	Avail.Storage	Storage Description
#1	95.80'	69,365 cf	BASIN C2 (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
95.80	46,907	1,774.0	0	0	46,907
97.00	69,436	1,851.0	69,365	69,365	69,225

Device	Routing	Invert	Outlet Devices
#1	Discarded	95.80'	2.410 in/hr Exfiltration over Surface area
#2	Primary	96.99'	6.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=2.62 cfs @ 16.79 hrs HW=95.80' (Free Discharge)
 ↑1=Exfiltration (Exfiltration Controls 2.62 cfs)

Primary OutFlow Max=0.00 cfs @ 0.10 hrs HW=95.80' (Free Discharge)
 ↑2=Orifice/Grate (Controls 0.00 cfs)

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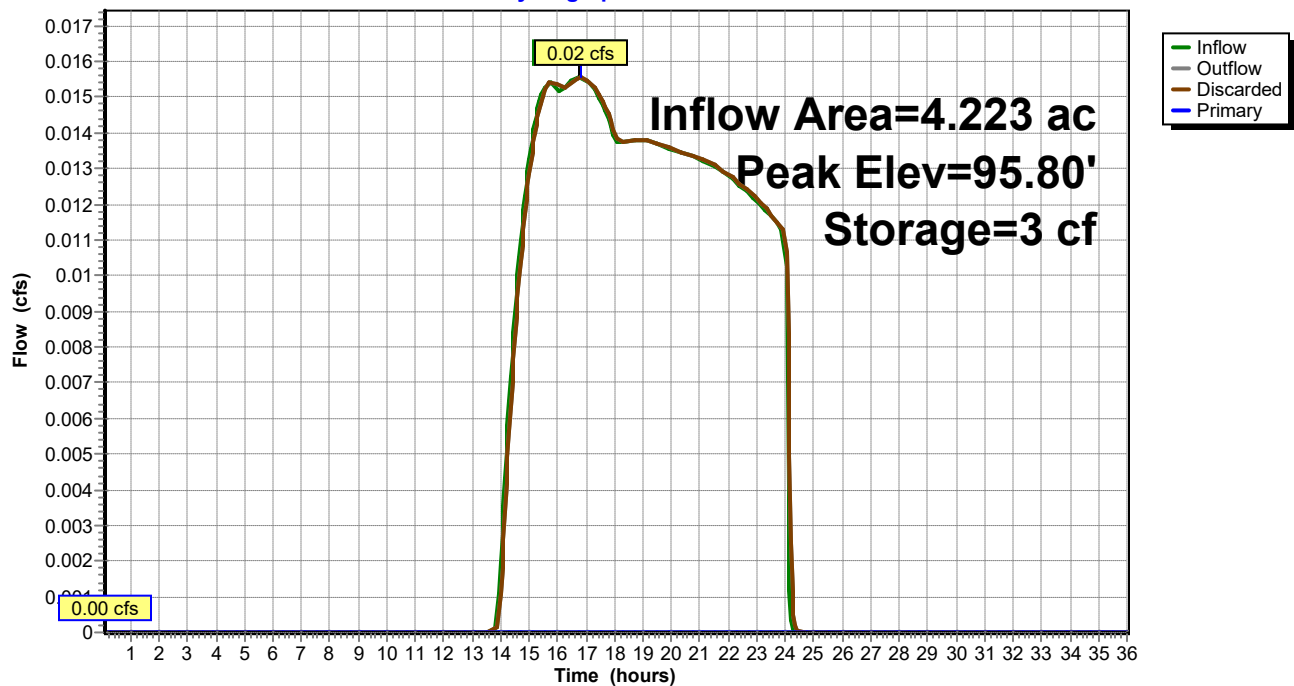
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Pond 5P: BASIN C2

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Summary for Pond 6P: BASIN C3

Inflow Area = 4.878 ac, 0.10% Impervious, Inflow Depth = 0.02" for 2-Year event
 Inflow = 0.01 cfs @ 17.28 hrs, Volume= 0.009 af
 Outflow = 0.01 cfs @ 17.33 hrs, Volume= 0.009 af, Atten= 0%, Lag= 3.4 min
 Discarded = 0.01 cfs @ 17.33 hrs, Volume= 0.009 af
 Primary = 0.00 cfs @ 0.10 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.10-36.00 hrs, dt= 0.05 hrs
 Peak Elev= 94.80' @ 17.33 hrs Surf.Area= 63,498 sf Storage= 3 cf

Plug-Flow detention time= 3.6 min calculated for 0.008 af (100% of inflow)
 Center-of-Mass det. time= 3.6 min (1,180.3 - 1,176.8)

Volume	Invert	Avail.Storage	Storage Description
#1	94.80'	88,830 cf	BASIN C3 (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
94.80	63,497	1,743.0	0	0	63,497
96.00	85,079	1,855.0	88,830	88,830	95,637

Device	Routing	Invert	Outlet Devices
#1	Discarded	94.80'	2.410 in/hr Exfiltration over Surface area
#2	Primary	95.99'	6.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=3.54 cfs @ 17.33 hrs HW=94.80' (Free Discharge)
 ↑ **1=Exfiltration** (Exfiltration Controls 3.54 cfs)

Primary OutFlow Max=0.00 cfs @ 0.10 hrs HW=94.80' (Free Discharge)
 ↑ **2=Orifice/Grate** (Controls 0.00 cfs)

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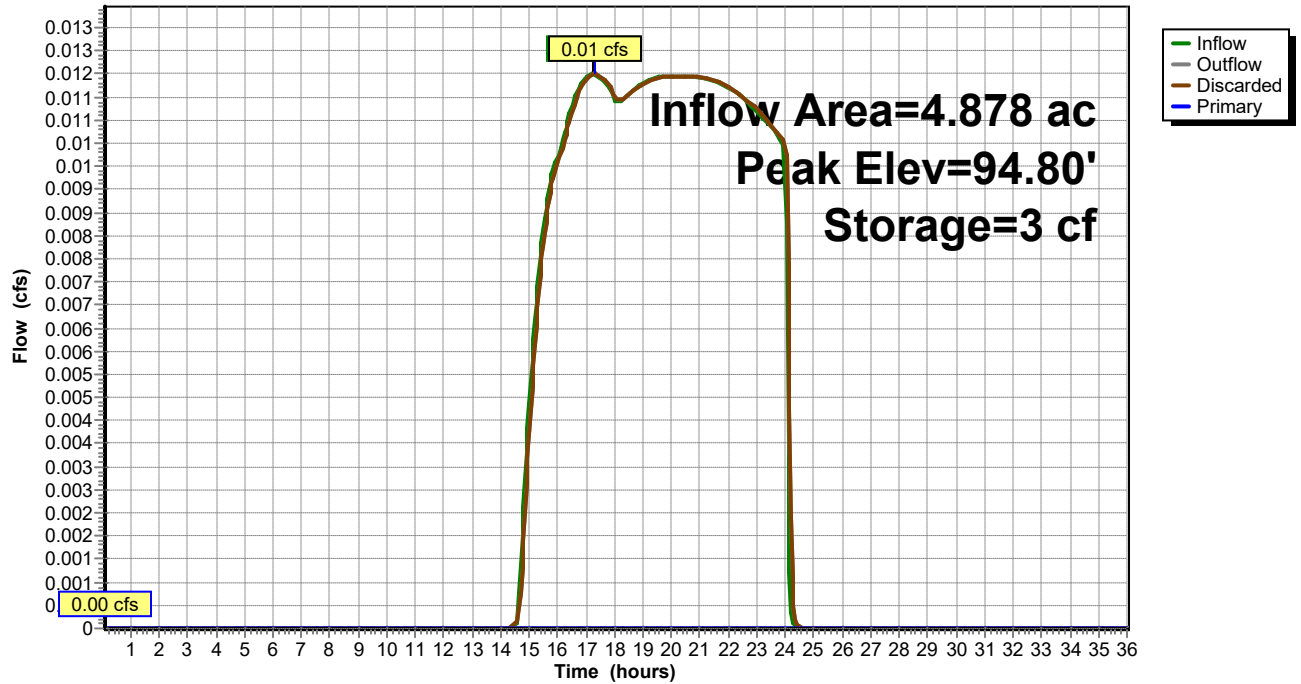
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Pond 6P: BASIN C3

Hydrograph



POST CONDITIONS CHIPAWAY*Type III 24-hr 10-Year Rainfall=4.88"*

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Time span=0.10-36.00 hrs, dt=0.05 hrs, 719 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

Subcatchment 1S: POST AREA A1	Runoff Area=62,707 sf 2.05% Impervious Runoff Depth=0.50" Tc=6.0 min CN=47 Runoff=0.35 cfs 0.059 af
Subcatchment 2S: POST AREA A2	Runoff Area=299,064 sf 0.09% Impervious Runoff Depth=0.36" Flow Length=507' Tc=11.7 min CN=44 Runoff=0.93 cfs 0.207 af
Subcatchment 3S: POST AREA A3	Runoff Area=69,526 sf 0.08% Impervious Runoff Depth=0.45" Tc=6.0 min CN=46 Runoff=0.33 cfs 0.060 af
Subcatchment 4S: POST AREA C1	Runoff Area=184,766 sf 0.76% Impervious Runoff Depth=0.32" Flow Length=347' Tc=7.2 min CN=43 Runoff=0.48 cfs 0.113 af
Subcatchment 5S: POST AREA C2	Runoff Area=183,945 sf 0.76% Impervious Runoff Depth=0.32" Tc=6.0 min CN=43 Runoff=0.49 cfs 0.113 af
Subcatchment 6S: POST AREA C3	Runoff Area=212,498 sf 0.10% Impervious Runoff Depth=0.28" Flow Length=228' Tc=6.1 min CN=42 Runoff=0.44 cfs 0.115 af
Pond 1P: BASIN A1	Peak Elev=93.90' Storage=67 cf Inflow=0.35 cfs 0.059 af Discarded=0.34 cfs 0.059 af Primary=0.00 cfs 0.000 af Outflow=0.34 cfs 0.059 af
Pond 2P: BASIN A2	Peak Elev=92.40' Storage=177 cf Inflow=0.93 cfs 0.207 af Discarded=0.90 cfs 0.207 af Primary=0.00 cfs 0.000 af Outflow=0.90 cfs 0.207 af
Pond 3P: BASIN A3	Peak Elev=94.81' Storage=230 cf Inflow=0.33 cfs 0.060 af Discarded=0.23 cfs 0.060 af Primary=0.00 cfs 0.000 af Outflow=0.23 cfs 0.060 af
Pond 4P: BASIN C1	Peak Elev=92.50' Storage=99 cf Inflow=0.48 cfs 0.113 af Discarded=0.46 cfs 0.113 af Primary=0.00 cfs 0.000 af Outflow=0.46 cfs 0.113 af
Pond 5P: BASIN C2	Peak Elev=95.80' Storage=100 cf Inflow=0.49 cfs 0.113 af Discarded=0.47 cfs 0.113 af Primary=0.00 cfs 0.000 af Outflow=0.47 cfs 0.113 af
Pond 6P: BASIN C3	Peak Elev=94.80' Storage=89 cf Inflow=0.44 cfs 0.115 af Discarded=0.41 cfs 0.115 af Primary=0.00 cfs 0.000 af Outflow=0.41 cfs 0.115 af
Total Runoff Area = 23.244 ac Runoff Volume = 0.667 af Average Runoff Depth = 0.34" 99.54% Pervious = 23.138 ac 0.46% Impervious = 0.106 ac	

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Summary for Subcatchment 1S: POST AREA A1

IMPERVIOUS AREA PER PANEL TABLE IS 0.698 S.F.

52 PANEL TABLES X 0.698 = 36.3 S.F.

Runoff = 0.35 cfs @ 12.15 hrs, Volume= 0.059 af, Depth= 0.50"

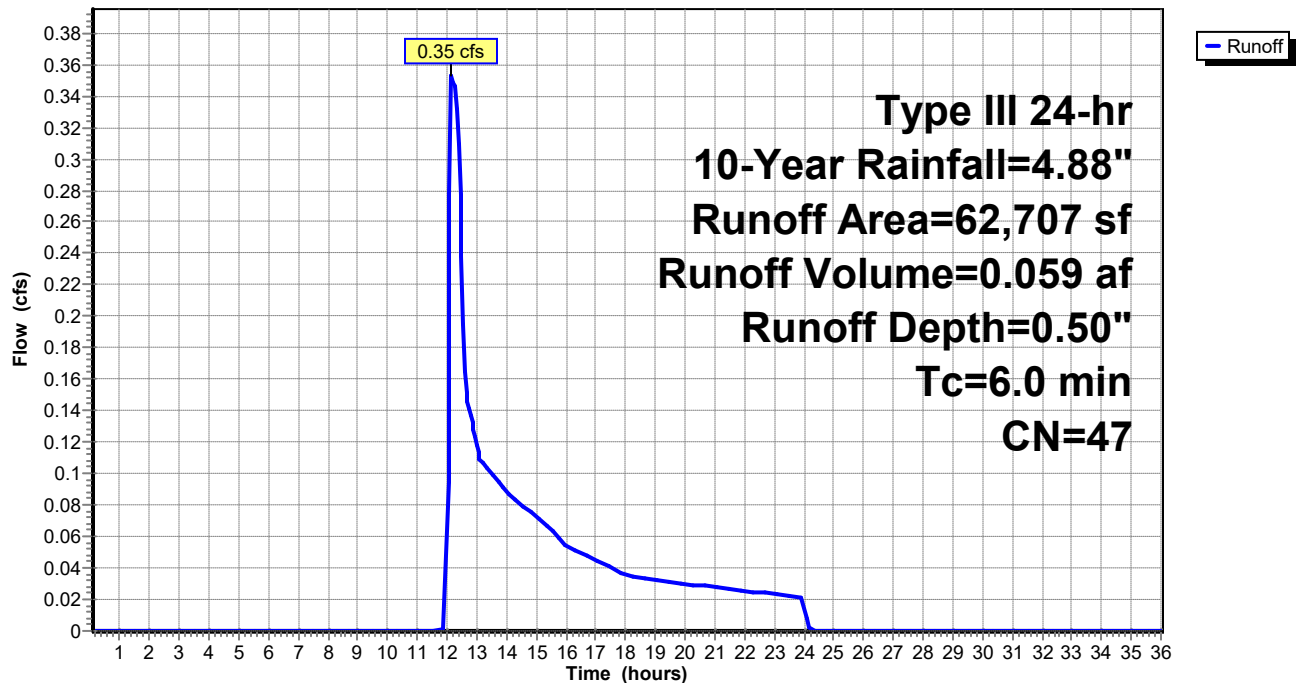
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.10-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.88"

Area (sf)	CN	Description
53,540	39	>75% Grass cover, Good, HSG A
7,880	96	Gravel surface, HSG A
* 36	98	PANEL SUPPORTS
* 1,250	98	TRANSFORMER PAD
* 1	98	UTILITY POLE
62,707	47	Weighted Average
61,420		97.95% Pervious Area
1,287		2.05% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment 1S: POST AREA A1

Hydrograph



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Summary for Subcatchment 2S: POST AREA A2

4-INCH OD ROUND STEEL PANEL SUPPORTS. EIGHT SUPPORTS PER PANEL TABLE.
IMPERVIOUS AREA PER PANEL TABLE IS 0.698 S.F.

373 PANEL GROUPS X 0.698 S.F = 260.3 S.F.

Runoff = 0.93 cfs @ 12.44 hrs, Volume= 0.207 af, Depth= 0.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.10-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.88"

Area (sf)	CN	Description
273,954	39	>75% Grass cover, Good, HSG A
* 260	98	PANEL SUPPORTS
24,850	96	Gravel surface, HSG A
299,064	44	Weighted Average
298,804		99.91% Pervious Area
260		0.09% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.1	258	0.0100	0.70		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
1.8	89	0.0140	0.83		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
3.8	160	0.0100	0.70		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
11.7	507	Total			

POST CONDITIONS CHIPAWAY

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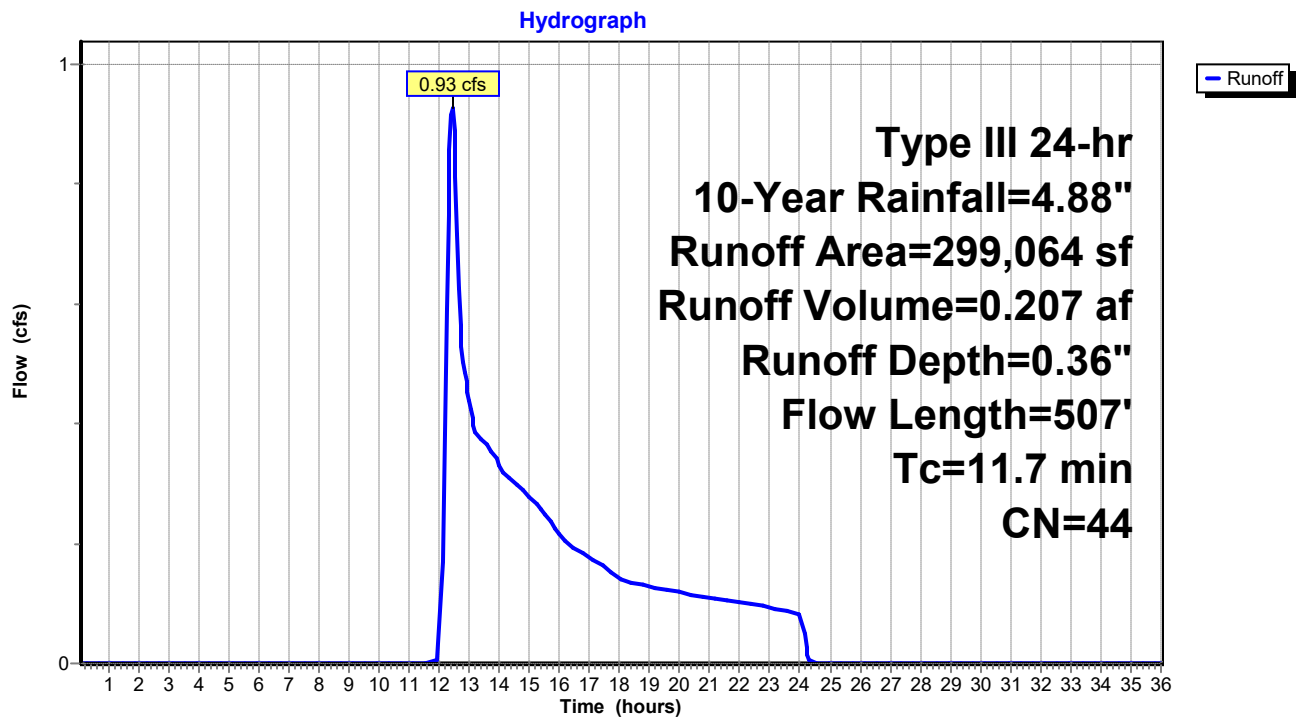
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Subcatchment 2S: POST AREA A2



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Summary for Subcatchment 3S: POST AREA A3

4-INCH OD ROUND STEEL PANEL SUPPORTS. EIGHT SUPPORTS PER PANEL TABLE.

IMPERVIOUS AREA PER PANEL TABLE IS 0.698 S.F.

85 PANEL GROUPS X 0.698 S.F = 59.3 S.F.

Runoff = 0.33 cfs @ 12.29 hrs, Volume= 0.060 af, Depth= 0.45"

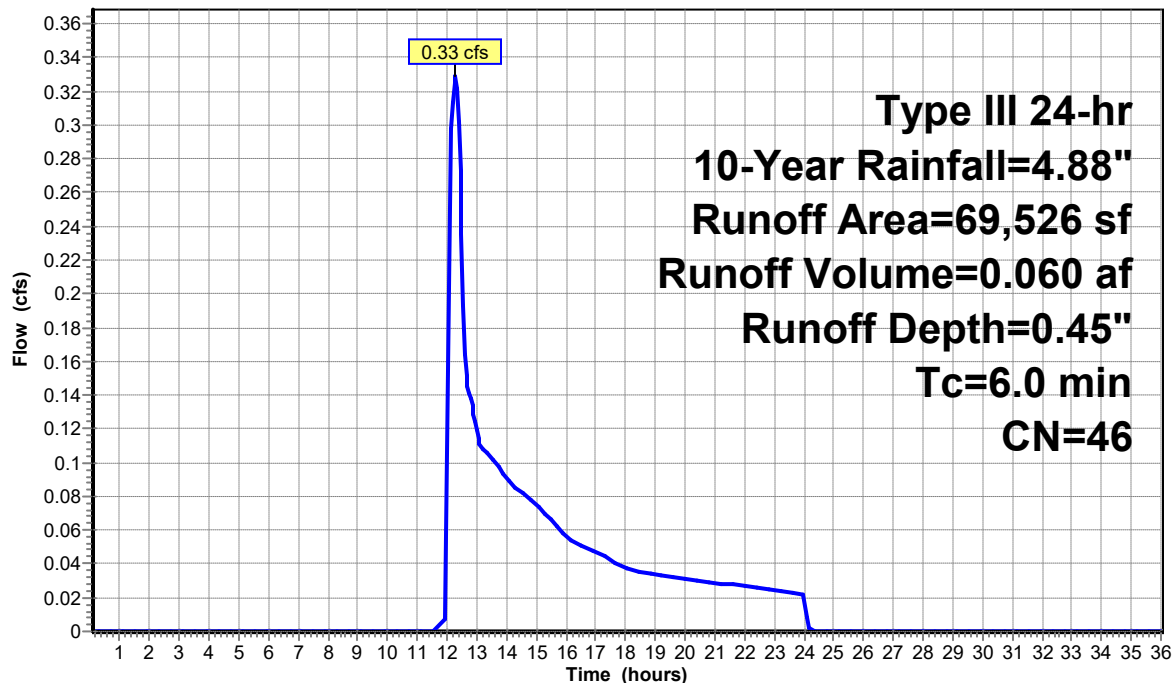
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.10-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.88"

Area (sf)	CN	Description
61,037	39	>75% Grass cover, Good, HSG A
8,430	96	Gravel surface, HSG A
* 59	98	PANEL SUPPORT POSTS
69,526	46	Weighted Average
69,467		99.92% Pervious Area
59		0.08% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment 3S: POST AREA A3

Hydrograph



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Summary for Subcatchment 4S: POST AREA C1

4-INCH OD ROUND STEEL PANEL SUPPORTS. EIGHT SUPPORTS PER PANEL TABLE.
IMPERVIOUS AREA PER PANEL TABLE IS 0.698 S.F.

UTILITY POLE AREA 10 INCH ROUND IS 0.55 S.F.

Runoff = 0.48 cfs @ 12.39 hrs, Volume= 0.113 af, Depth= 0.32"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.10-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.88"

	Area (sf)	CN	Description
	171,317	39	>75% Grass cover, Good, HSG A
*	145	98	SOLAR SUPPORTS
	12,050	96	Gravel surface, HSG A
*	1,250	98	TRANSFORMER PAD
*	4	98	UTILITY POLES
	184,766	43	Weighted Average
	183,367		99.24% Pervious Area
	1,399		0.76% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.1	119	0.0180	0.94		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
4.2	147	0.0070	0.59		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.9	81	0.0430	1.45		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
7.2	347	Total			

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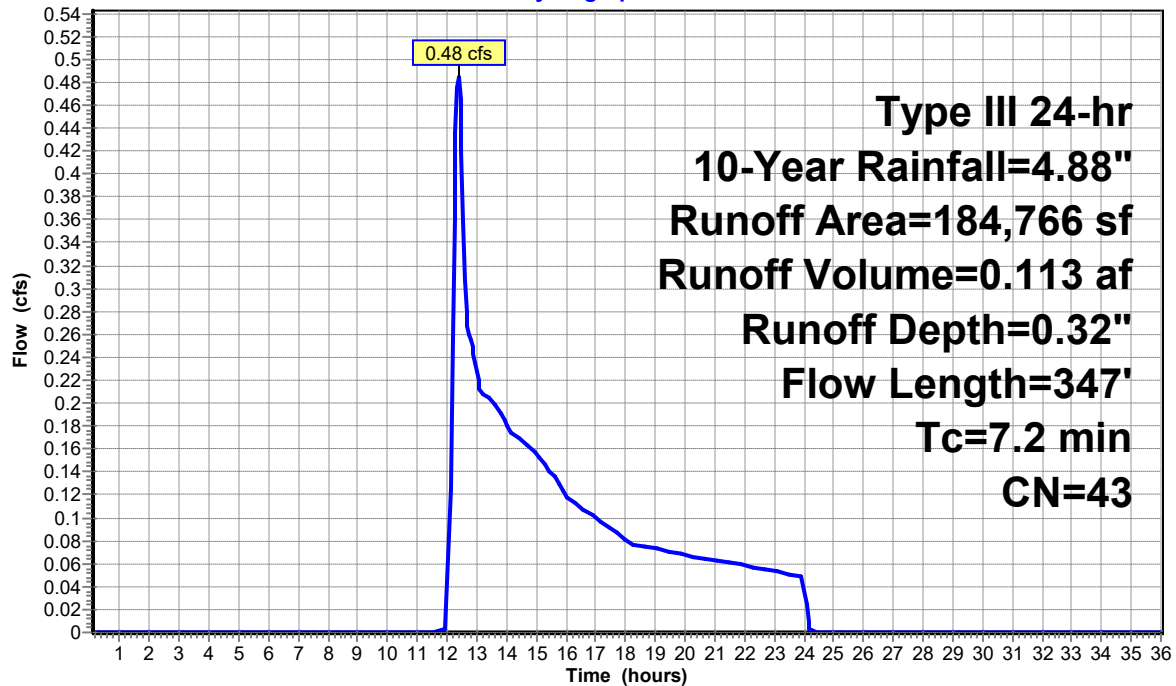
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Subcatchment 4S: POST AREA C1

Hydrograph



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Summary for Subcatchment 5S: POST AREA C2

4-INCH OD ROUND STEEL PANEL SUPPORTS. EIGHT SUPPORTS PER PANEL TABLE.
IMPERVIOUS AREA PER PANEL TABLE IS 0.698 S.F.

Runoff = 0.49 cfs @ 12.37 hrs, Volume= 0.113 af, Depth= 0.32"

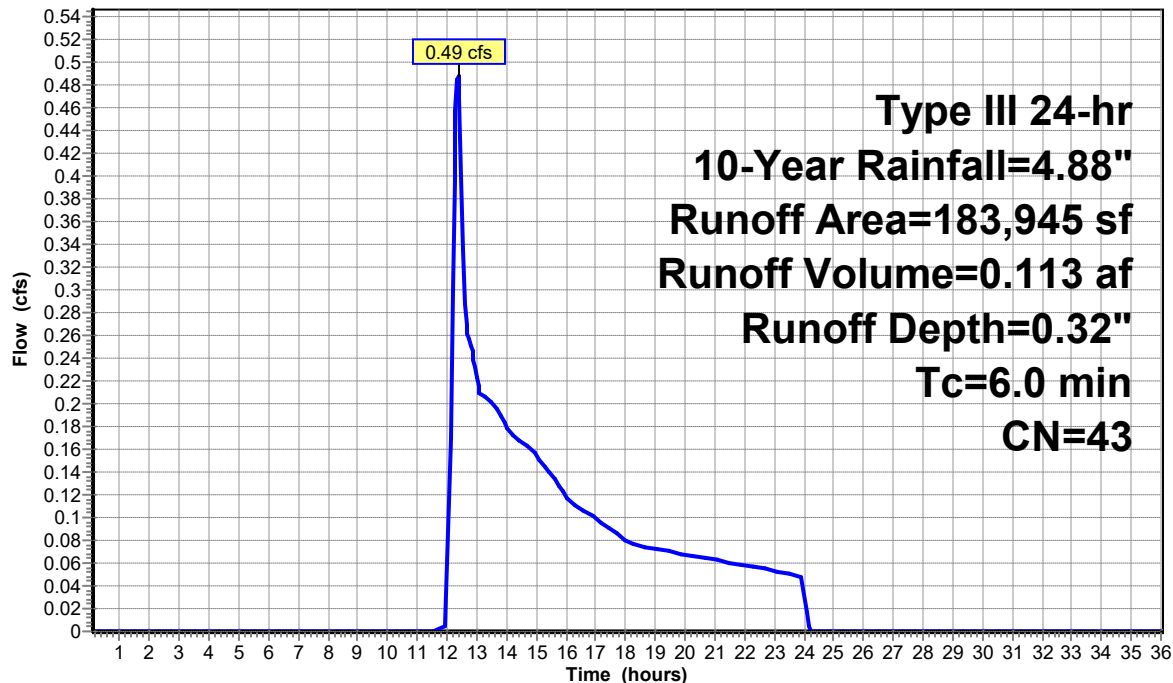
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.10-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.88"

	Area (sf)	CN	Description
	171,846	39	>75% Grass cover, Good, HSG A
*	149	98	SOLAR SUPPORTS
*	1,250	98	TRANSFORMER PAD
	10,700	96	Gravel surface, HSG A
	183,945	43	Weighted Average
	182,546		99.24% Pervious Area
	1,399		0.76% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment 5S: POST AREA C2

Hydrograph



POST CONDITIONS CHIPAWAY

Type III 24-hr 10-Year Rainfall=4.88"

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Summary for Subcatchment 6S: POST AREA C3

4-INCH OD ROUND STEEL PANEL SUPPORTS. EIGHT SUPPORTS PER PANEL TABLE.
 IMPERVIOUS AREA PER PANEL TABLE IS 0.698 S.F.

10 INCH DIA UTILITY POLE A = 0.55S.F.

Runoff = 0.44 cfs @ 12.40 hrs, Volume= 0.115 af, Depth= 0.28"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.10-36.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-Year Rainfall=4.88"

Area (sf)	CN	Description
202,735	39	>75% Grass cover, Good, HSG A
* 210	98	SOLAR SUPPORTS
9,550	96	Gravel surface, HSG A
* 3	98	UTILITY POLES
212,498	42	Weighted Average
212,285		99.90% Pervious Area
213		0.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.5	15	0.0130	0.10		Sheet Flow, Grass: Short n= 0.150 P2= 3.31"
0.6	28	0.0130	0.80		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
1.5	91	0.0220	1.04		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
1.5	94	0.0220	1.04		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
6.1	228	Total			

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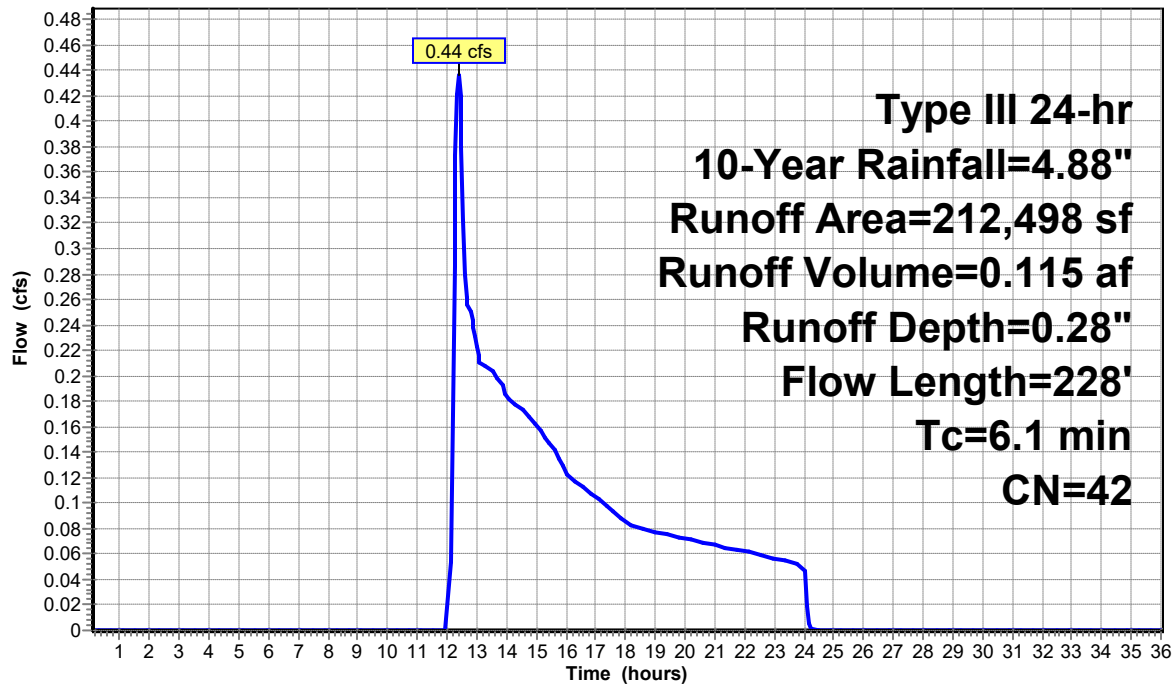
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Subcatchment 6S: POST AREA C3

Hydrograph



POST CONDITIONS CHIPAWAY

Type III 24-hr 10-Year Rainfall=4.88"

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Summary for Pond 1P: BASIN A1

Inflow Area = 1.440 ac, 2.05% Impervious, Inflow Depth = 0.50" for 10-Year event
 Inflow = 0.35 cfs @ 12.15 hrs, Volume= 0.059 af
 Outflow = 0.34 cfs @ 12.31 hrs, Volume= 0.059 af, Atten= 3%, Lag= 9.8 min
 Discarded = 0.34 cfs @ 12.31 hrs, Volume= 0.059 af
 Primary = 0.00 cfs @ 0.10 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.10-36.00 hrs, dt= 0.05 hrs
 Peak Elev= 93.90' @ 12.31 hrs Surf.Area= 30,917 sf Storage= 67 cf

Plug-Flow detention time= 3.3 min calculated for 0.059 af (100% of inflow)
 Center-of-Mass det. time= 3.3 min (939.6 - 936.3)

Volume	Invert	Avail.Storage	Storage Description
#1	93.90'	38,781 cf	BASIN A1 (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
93.90	30,901	704.0	0	0	30,901
95.00	39,797	779.0	38,781	38,781	39,790

Device	Routing	Invert	Outlet Devices
#1	Discarded	93.90'	2.410 in/hr Exfiltration over Surface area
#2	Primary	94.99'	12.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=1.72 cfs @ 12.31 hrs HW=93.90' (Free Discharge)
 ↑1=Exfiltration (Exfiltration Controls 1.72 cfs)

Primary OutFlow Max=0.00 cfs @ 0.10 hrs HW=93.90' (Free Discharge)
 ↑2=Orifice/Grate (Controls 0.00 cfs)

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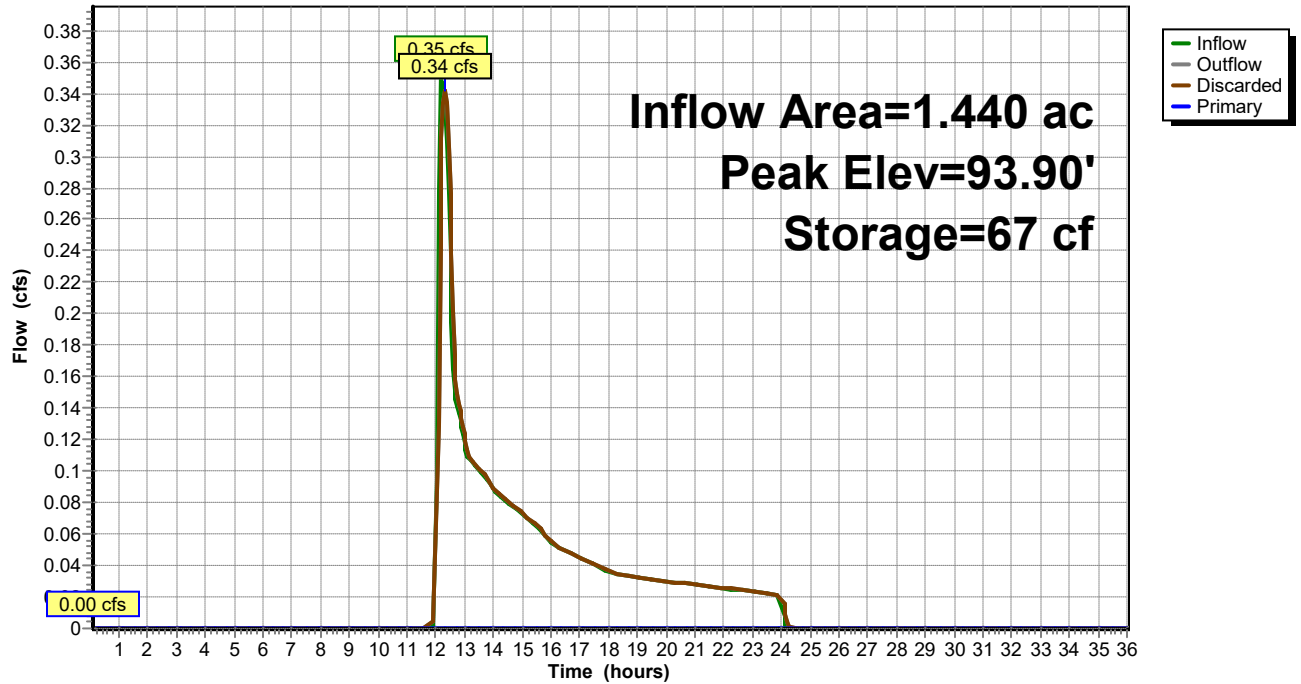
Type III 24-hr 10-Year Rainfall=4.88"

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Pond 1P: BASIN A1

Hydrograph



POST CONDITIONS CHIPAWAY

Type III 24-hr 10-Year Rainfall=4.88"

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Summary for Pond 2P: BASIN A2

Inflow Area = 6.866 ac, 0.09% Impervious, Inflow Depth = 0.36" for 10-Year event
 Inflow = 0.93 cfs @ 12.44 hrs, Volume= 0.207 af
 Outflow = 0.90 cfs @ 12.49 hrs, Volume= 0.207 af, Atten= 3%, Lag= 3.4 min
 Discarded = 0.90 cfs @ 12.49 hrs, Volume= 0.207 af
 Primary = 0.00 cfs @ 0.10 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.10-36.00 hrs, dt= 0.05 hrs
 Peak Elev= 92.40' @ 12.49 hrs Surf.Area= 77,734 sf Storage= 177 cf

Plug-Flow detention time= 3.3 min calculated for 0.207 af (100% of inflow)
 Center-of-Mass det. time= 3.3 min (968.2 - 964.9)

Volume	Invert	Avail.Storage	Storage Description
#1	92.40'	97,201 cf	BASIN A2 (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
92.40	77,692	1,788.0	0	0	77,692
93.50	99,485	1,864.0	97,201	97,201	99,870

Device	Routing	Invert	Outlet Devices
#1	Discarded	92.40'	2.410 in/hr Exfiltration over Surface area
#2	Primary	93.49'	12.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=4.34 cfs @ 12.49 hrs HW=92.40' (Free Discharge)
 ↑1=Exfiltration (Exfiltration Controls 4.34 cfs)

Primary OutFlow Max=0.00 cfs @ 0.10 hrs HW=92.40' (Free Discharge)
 ↑2=Orifice/Grate (Controls 0.00 cfs)

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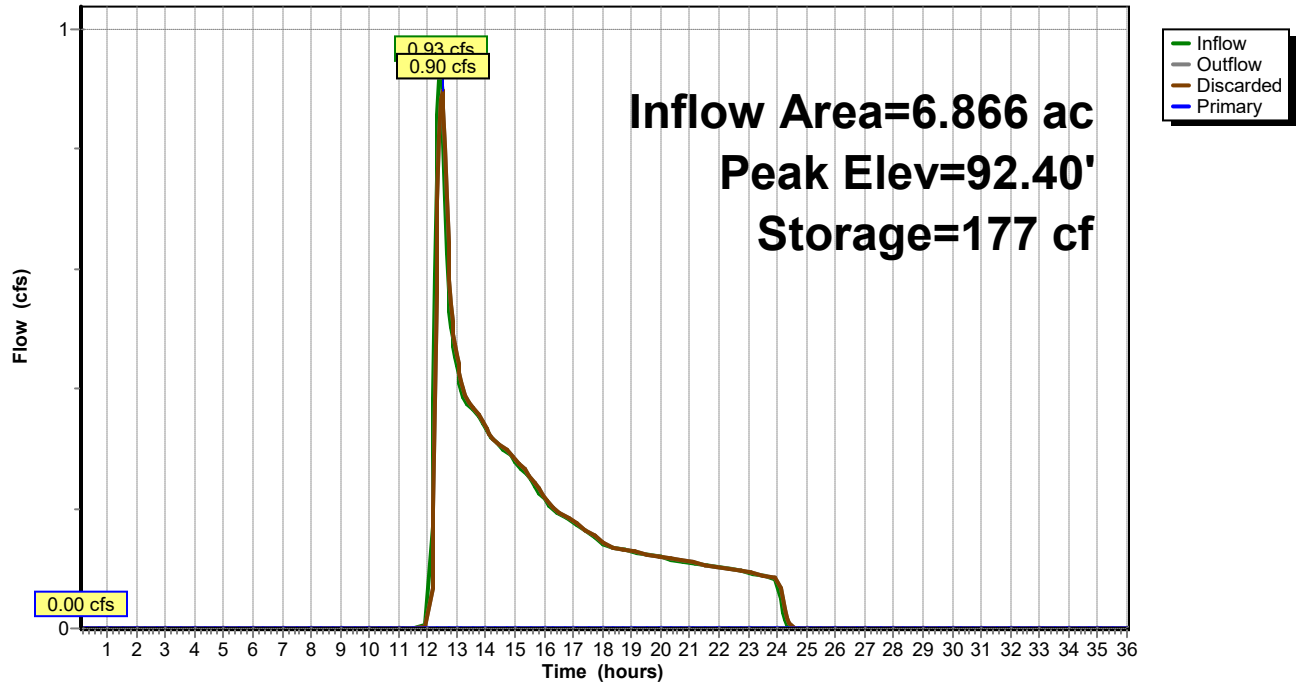
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Pond 2P: BASIN A2

Hydrograph



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Summary for Pond 3P: BASIN A3

Inflow Area = 1.596 ac, 0.08% Impervious, Inflow Depth = 0.45" for 10-Year event
 Inflow = 0.33 cfs @ 12.29 hrs, Volume= 0.060 af
 Outflow = 0.23 cfs @ 12.51 hrs, Volume= 0.060 af, Atten= 30%, Lag= 12.8 min
 Discarded = 0.23 cfs @ 12.51 hrs, Volume= 0.060 af
 Primary = 0.00 cfs @ 0.10 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.10-36.00 hrs, dt= 0.05 hrs
 Peak Elev= 94.81' @ 12.51 hrs Surf.Area= 23,951 sf Storage= 230 cf

Plug-Flow detention time= 16.5 min calculated for 0.060 af (100% of inflow)
 Center-of-Mass det. time= 16.6 min (960.0 - 943.4)

Volume	Invert	Avail.Storage	Storage Description
#1	94.80'	33,179 cf	BASIN A3 (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
94.80	23,894	603.0	0	0	23,894
96.00	31,582	678.0	33,179	33,179	31,578

Device	Routing	Invert	Outlet Devices
#1	Discarded	94.80'	0.520 in/hr Exfiltration over Surface area
#2	Primary	95.99'	12.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.29 cfs @ 12.51 hrs HW=94.81' (Free Discharge)
 ↑1=Exfiltration (Exfiltration Controls 0.29 cfs)

Primary OutFlow Max=0.00 cfs @ 0.10 hrs HW=94.80' (Free Discharge)
 ↑2=Orifice/Grate (Controls 0.00 cfs)

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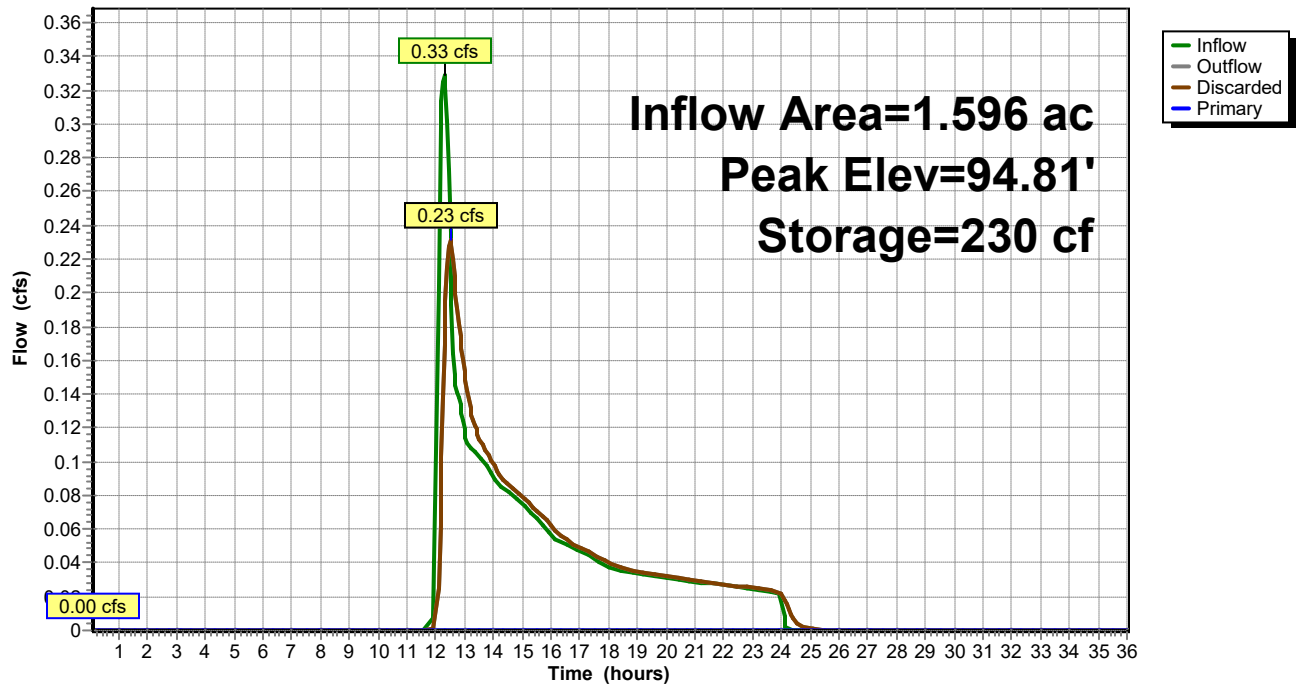
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Pond 3P: BASIN A3

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Summary for Pond 4P: BASIN C1

Inflow Area = 4.242 ac, 0.76% Impervious, Inflow Depth = 0.32" for 10-Year event
 Inflow = 0.48 cfs @ 12.39 hrs, Volume= 0.113 af
 Outflow = 0.46 cfs @ 12.45 hrs, Volume= 0.113 af, Atten= 4%, Lag= 3.7 min
 Discarded = 0.46 cfs @ 12.45 hrs, Volume= 0.113 af
 Primary = 0.00 cfs @ 0.10 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.10-36.00 hrs, dt= 0.05 hrs
 Peak Elev= 92.50' @ 12.45 hrs Surf.Area= 33,011 sf Storage= 99 cf

Plug-Flow detention time= 3.6 min calculated for 0.113 af (100% of inflow)
 Center-of-Mass det. time= 3.6 min (973.7 - 970.2)

Volume	Invert	Avail.Storage	Storage Description
#1	92.50'	46,528 cf	BASIN C1 (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
92.50	32,983	1,458.0	0	0	32,983
93.70	44,867	1,512.0	46,528	46,528	45,869

Device	Routing	Invert	Outlet Devices
#1	Discarded	92.50'	2.410 in/hr Exfiltration over Surface area
#2	Primary	93.69'	6.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=1.84 cfs @ 12.45 hrs HW=92.50' (Free Discharge)
 ↑ **1=Exfiltration** (Exfiltration Controls 1.84 cfs)

Primary OutFlow Max=0.00 cfs @ 0.10 hrs HW=92.50' (Free Discharge)
 ↑ **2=Orifice/Grate** (Controls 0.00 cfs)

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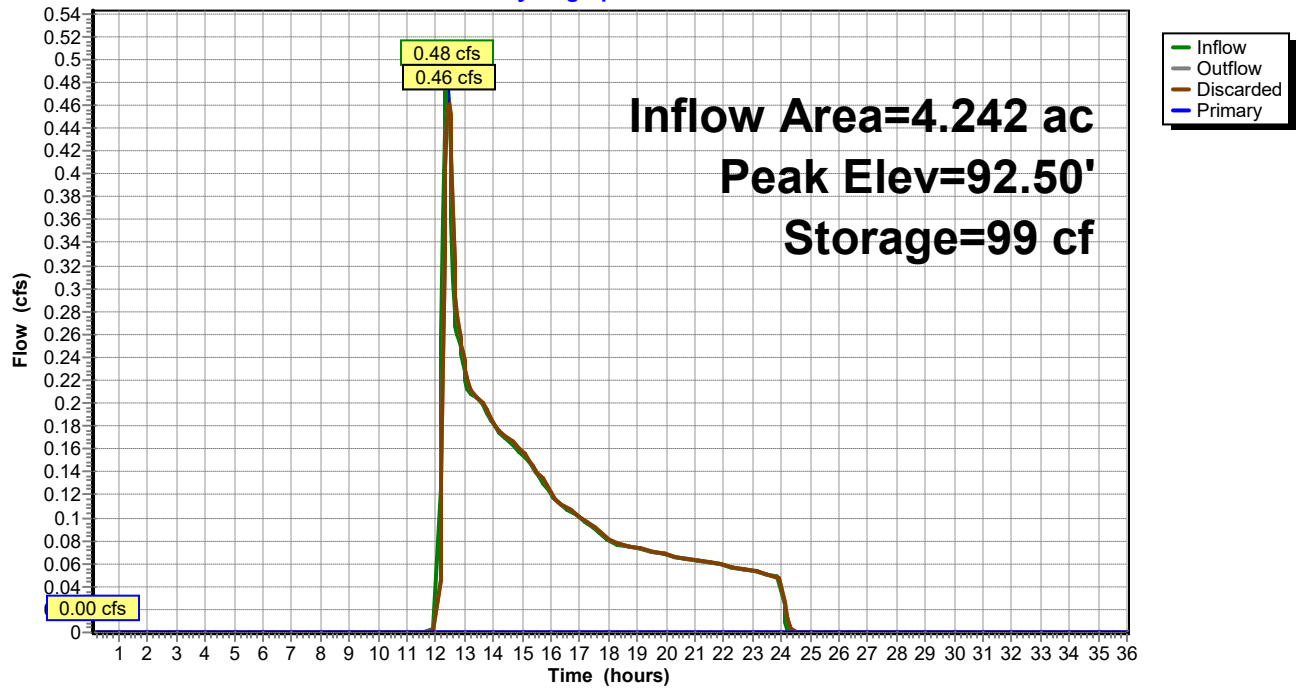
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Pond 4P: BASIN C1

Hydrograph



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Summary for Pond 5P: BASIN C2

Inflow Area = 4.223 ac, 0.76% Impervious, Inflow Depth = 0.32" for 10-Year event
 Inflow = 0.49 cfs @ 12.37 hrs, Volume= 0.113 af
 Outflow = 0.47 cfs @ 12.43 hrs, Volume= 0.113 af, Atten= 4%, Lag= 3.8 min
 Discarded = 0.47 cfs @ 12.43 hrs, Volume= 0.113 af
 Primary = 0.00 cfs @ 0.10 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.10-36.00 hrs, dt= 0.05 hrs
 Peak Elev= 95.80' @ 12.43 hrs Surf.Area= 46,943 sf Storage= 100 cf

Plug-Flow detention time= 3.6 min calculated for 0.113 af (100% of inflow)
 Center-of-Mass det. time= 3.6 min (972.6 - 969.1)

Volume	Invert	Avail.Storage	Storage Description
#1	95.80'	69,365 cf	BASIN C2 (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
95.80	46,907	1,774.0	0	0	46,907
97.00	69,436	1,851.0	69,365	69,365	69,225

Device	Routing	Invert	Outlet Devices
#1	Discarded	95.80'	2.410 in/hr Exfiltration over Surface area
#2	Primary	96.99'	6.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=2.62 cfs @ 12.43 hrs HW=95.80' (Free Discharge)
 ↑1=Exfiltration (Exfiltration Controls 2.62 cfs)

Primary OutFlow Max=0.00 cfs @ 0.10 hrs HW=95.80' (Free Discharge)
 ↑2=Orifice/Grate (Controls 0.00 cfs)

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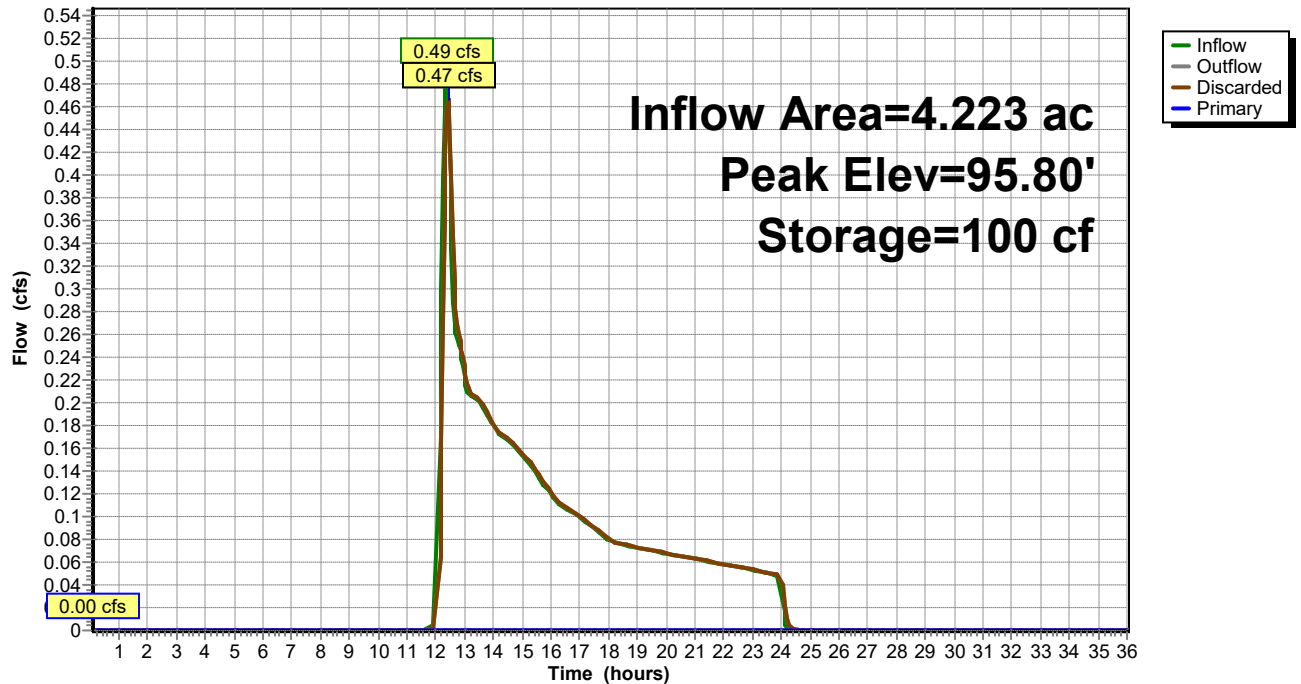
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Pond 5P: BASIN C2

Hydrograph



POST CONDITIONS CHIPAWAY

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Summary for Pond 6P: BASIN C3

Inflow Area = 4.878 ac, 0.10% Impervious, Inflow Depth = 0.28" for 10-Year event
 Inflow = 0.44 cfs @ 12.40 hrs, Volume= 0.115 af
 Outflow = 0.41 cfs @ 12.46 hrs, Volume= 0.115 af, Atten= 5%, Lag= 3.7 min
 Discarded = 0.41 cfs @ 12.46 hrs, Volume= 0.115 af
 Primary = 0.00 cfs @ 0.10 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.10-36.00 hrs, dt= 0.05 hrs
 Peak Elev= 94.80' @ 12.46 hrs Surf.Area= 63,520 sf Storage= 89 cf

Plug-Flow detention time= 3.6 min calculated for 0.114 af (100% of inflow)
 Center-of-Mass det. time= 3.6 min (983.2 - 979.6)

Volume	Invert	Avail.Storage	Storage Description
#1	94.80'	88,830 cf	BASIN C3 (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
94.80	63,497	1,743.0	0	0	63,497
96.00	85,079	1,855.0	88,830	88,830	95,637

Device	Routing	Invert	Outlet Devices
#1	Discarded	94.80'	2.410 in/hr Exfiltration over Surface area
#2	Primary	95.99'	6.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=3.54 cfs @ 12.46 hrs HW=94.80' (Free Discharge)
 ↑1=Exfiltration (Exfiltration Controls 3.54 cfs)

Primary OutFlow Max=0.00 cfs @ 0.10 hrs HW=94.80' (Free Discharge)
 ↑2=Orifice/Grate (Controls 0.00 cfs)

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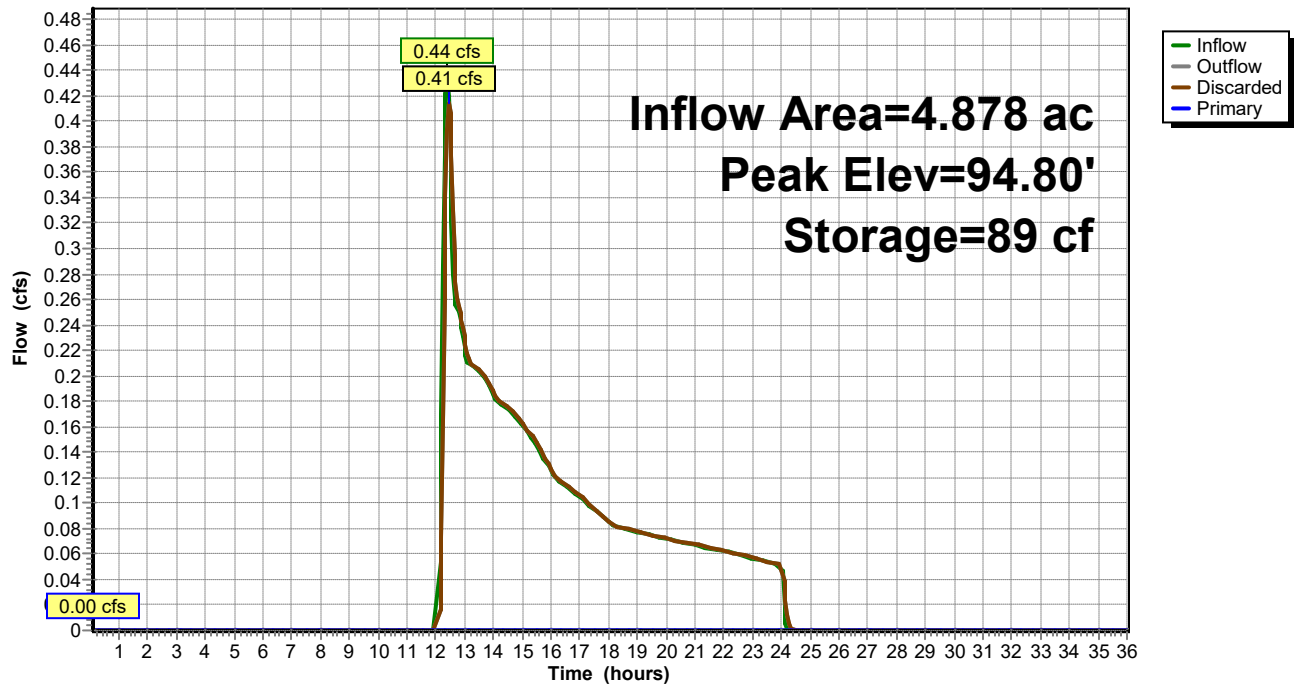
Type III 24-hr 10-Year Rainfall=4.88"

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Pond 6P: BASIN C3

Hydrograph



POST CONDITIONS CHIPAWAY*Type III 24-hr 100-Year Rainfall=8.52"*

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Time span=0.10-36.00 hrs, dt=0.05 hrs, 719 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

Subcatchment 1S: POST AREA A1 Runoff Area=62,707 sf 2.05% Impervious Runoff Depth=2.24"
Tc=6.0 min CN=47 Runoff=3.35 cfs 0.268 af

Subcatchment 2S: POST AREA A2 Runoff Area=299,064 sf 0.09% Impervious Runoff Depth=1.91"
Flow Length=507' Tc=11.7 min CN=44 Runoff=10.57 cfs 1.092 af

Subcatchment 3S: POST AREA A3 Runoff Area=69,526 sf 0.08% Impervious Runoff Depth=2.13"
Tc=6.0 min CN=46 Runoff=3.47 cfs 0.283 af

Subcatchment 4S: POST AREA C1 Runoff Area=184,766 sf 0.76% Impervious Runoff Depth=1.80"
Flow Length=347' Tc=7.2 min CN=43 Runoff=7.00 cfs 0.637 af

Subcatchment 5S: POST AREA C2 Runoff Area=183,945 sf 0.76% Impervious Runoff Depth=1.80"
Tc=6.0 min CN=43 Runoff=7.30 cfs 0.634 af

Subcatchment 6S: POST AREA C3 Runoff Area=212,498 sf 0.10% Impervious Runoff Depth=1.69"
Flow Length=228' Tc=6.1 min CN=42 Runoff=7.69 cfs 0.689 af

Pond 1P: BASIN A1 Peak Elev=93.94' Storage=1,103 cf Inflow=3.35 cfs 0.268 af
Discarded=1.74 cfs 0.268 af Primary=0.00 cfs 0.000 af Outflow=1.74 cfs 0.268 af

Pond 2P: BASIN A2 Peak Elev=92.49' Storage=7,151 cf Inflow=10.57 cfs 1.092 af
Discarded=4.43 cfs 1.092 af Primary=0.00 cfs 0.000 af Outflow=4.43 cfs 1.092 af

Pond 3P: BASIN A3 Peak Elev=95.00' Storage=4,942 cf Inflow=3.47 cfs 0.283 af
Discarded=0.30 cfs 0.283 af Primary=0.00 cfs 0.000 af Outflow=0.30 cfs 0.283 af

Pond 4P: BASIN C1 Peak Elev=92.66' Storage=5,532 cf Inflow=7.00 cfs 0.637 af
Discarded=1.92 cfs 0.637 af Primary=0.00 cfs 0.000 af Outflow=1.92 cfs 0.637 af

Pond 5P: BASIN C2 Peak Elev=95.89' Storage=4,105 cf Inflow=7.30 cfs 0.634 af
Discarded=2.70 cfs 0.634 af Primary=0.00 cfs 0.000 af Outflow=2.70 cfs 0.634 af

Pond 6P: BASIN C3 Peak Elev=94.85' Storage=3,263 cf Inflow=7.69 cfs 0.689 af
Discarded=3.59 cfs 0.689 af Primary=0.00 cfs 0.000 af Outflow=3.59 cfs 0.689 af

Total Runoff Area = 23.244 ac Runoff Volume = 3.602 af Average Runoff Depth = 1.86"
99.54% Pervious = 23.138 ac 0.46% Impervious = 0.106 ac

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Summary for Subcatchment 1S: POST AREA A1

IMPERVIOUS AREA PER PANEL TABLE IS 0.698 S.F.

52 PANEL TABLES X 0.698 = 36.3 S.F.

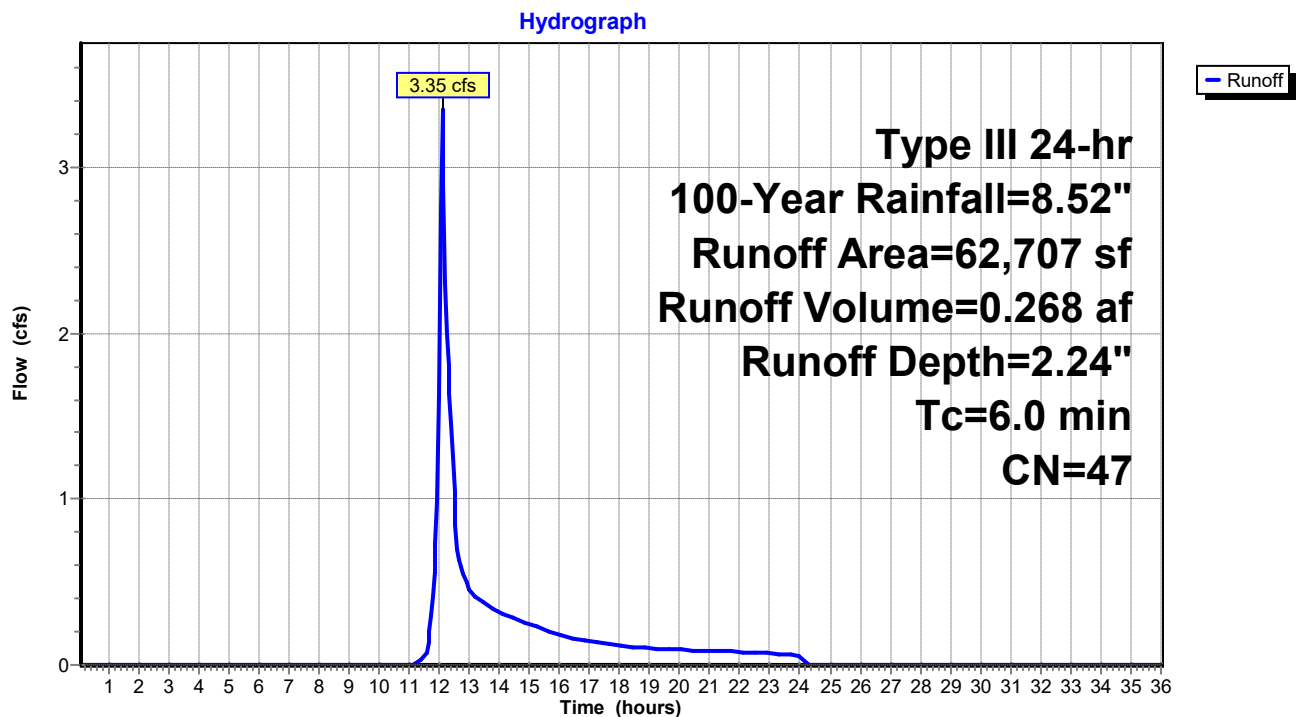
Runoff = 3.35 cfs @ 12.10 hrs, Volume= 0.268 af, Depth= 2.24"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.10-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=8.52"

Area (sf)	CN	Description
53,540	39	>75% Grass cover, Good, HSG A
7,880	96	Gravel surface, HSG A
* 36	98	PANEL SUPPORTS
* 1,250	98	TRANSFORMER PAD
* 1	98	UTILITY POLE
62,707	47	Weighted Average
61,420		97.95% Pervious Area
1,287		2.05% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment 1S: POST AREA A1



POST CONDITIONS CHIPAWAY

Type III 24-hr 100-Year Rainfall=8.52"

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Summary for Subcatchment 2S: POST AREA A2

4-INCH OD ROUND STEEL PANEL SUPPORTS. EIGHT SUPPORTS PER PANEL TABLE.
IMPERVIOUS AREA PER PANEL TABLE IS 0.698 S.F.

373 PANEL GROUPS X 0.698 S.F = 260.3 S.F.

Runoff = 10.57 cfs @ 12.19 hrs, Volume= 1.092 af, Depth= 1.91"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.10-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=8.52"

Area (sf)	CN	Description
273,954	39	>75% Grass cover, Good, HSG A
* 260	98	PANEL SUPPORTS
24,850	96	Gravel surface, HSG A
299,064	44	Weighted Average
298,804		99.91% Pervious Area
260		0.09% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.1	258	0.0100	0.70		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
1.8	89	0.0140	0.83		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
3.8	160	0.0100	0.70		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
11.7	507	Total			

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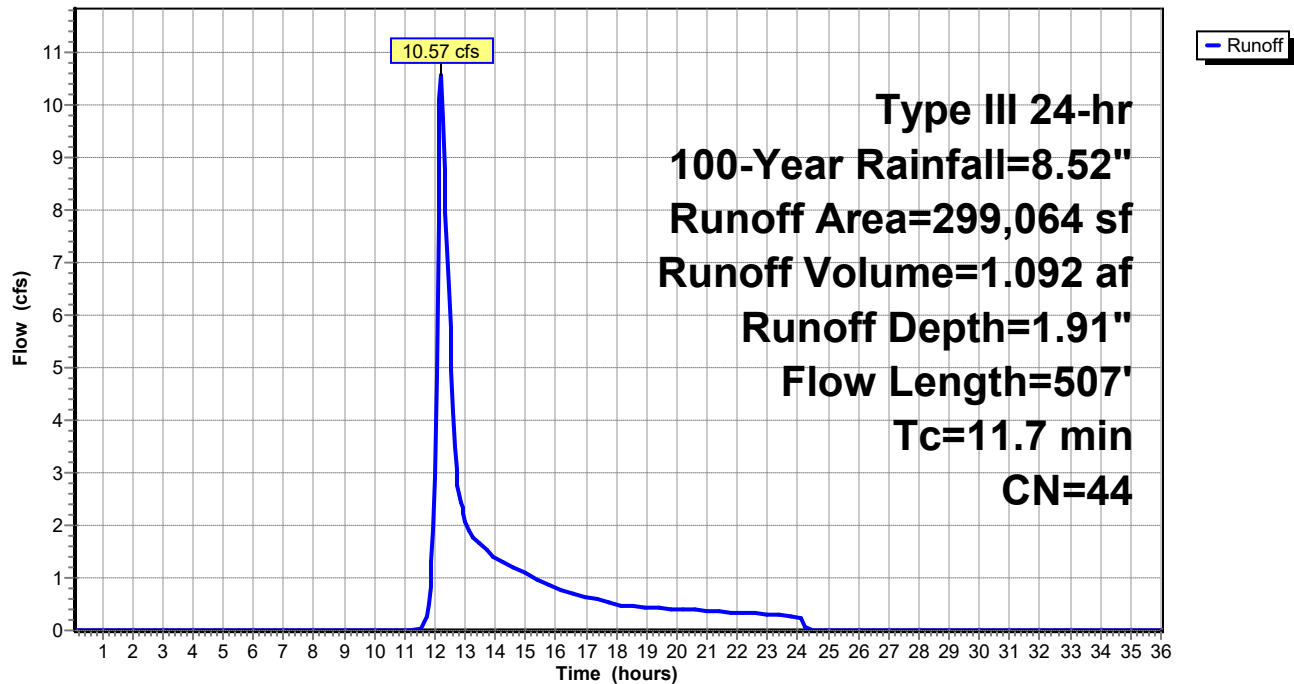
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Subcatchment 2S: POST AREA A2

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Summary for Subcatchment 3S: POST AREA A3

4-INCH OD ROUND STEEL PANEL SUPPORTS. EIGHT SUPPORTS PER PANEL TABLE.

IMPERVIOUS AREA PER PANEL TABLE IS 0.698 S.F.

85 PANEL GROUPS X 0.698 S.F = 59.3 S.F.

Runoff = 3.47 cfs @ 12.11 hrs, Volume= 0.283 af, Depth= 2.13"

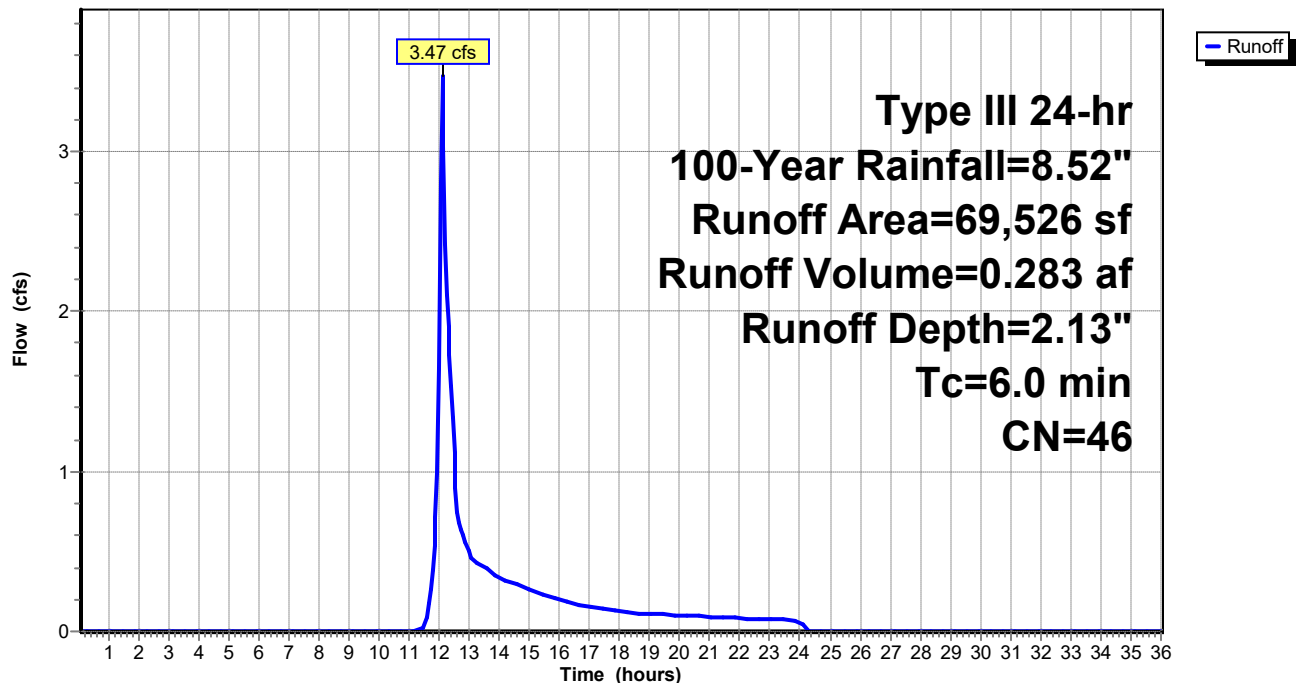
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.10-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=8.52"

Area (sf)	CN	Description
61,037	39	>75% Grass cover, Good, HSG A
8,430	96	Gravel surface, HSG A
* 59	98	PANEL SUPPORT POSTS
69,526	46	Weighted Average
69,467		99.92% Pervious Area
59		0.08% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment 3S: POST AREA A3

Hydrograph



POST CONDITIONS CHIPAWAY

Type III 24-hr 100-Year Rainfall=8.52"

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Summary for Subcatchment 4S: POST AREA C1

4-INCH OD ROUND STEEL PANEL SUPPORTS. EIGHT SUPPORTS PER PANEL TABLE.
IMPERVIOUS AREA PER PANEL TABLE IS 0.698 S.F.

UTILITY POLE AREA 10 INCH ROUND IS 0.55 S.F.

Runoff = 7.00 cfs @ 12.12 hrs, Volume= 0.637 af, Depth= 1.80"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.10-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=8.52"

	Area (sf)	CN	Description
	171,317	39	>75% Grass cover, Good, HSG A
*	145	98	SOLAR SUPPORTS
	12,050	96	Gravel surface, HSG A
*	1,250	98	TRANSFORMER PAD
*	4	98	UTILITY POLES
	184,766	43	Weighted Average
	183,367		99.24% Pervious Area
	1,399		0.76% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.1	119	0.0180	0.94		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
4.2	147	0.0070	0.59		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.9	81	0.0430	1.45		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
7.2	347	Total			

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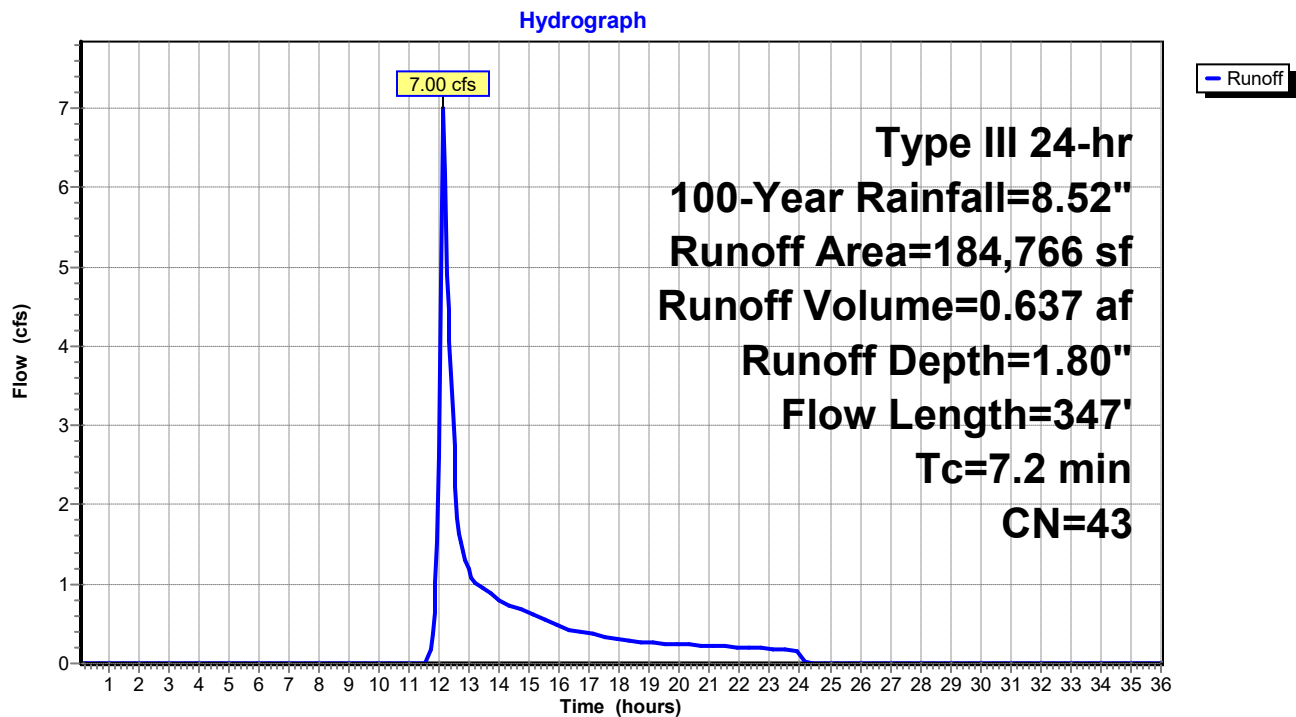
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Subcatchment 4S: POST AREA C1



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Summary for Subcatchment 5S: POST AREA C2

4-INCH OD ROUND STEEL PANEL SUPPORTS. EIGHT SUPPORTS PER PANEL TABLE.
IMPERVIOUS AREA PER PANEL TABLE IS 0.698 S.F.

Runoff = 7.30 cfs @ 12.11 hrs, Volume= 0.634 af, Depth= 1.80"

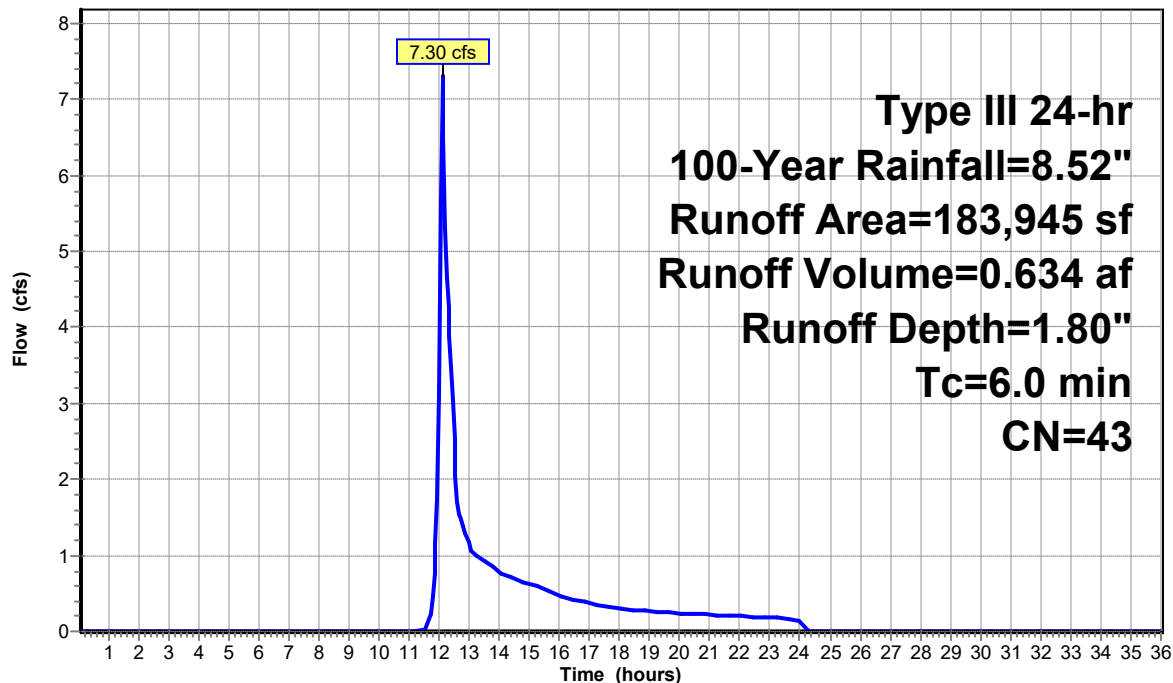
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.10-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=8.52"

	Area (sf)	CN	Description
	171,846	39	>75% Grass cover, Good, HSG A
*	149	98	SOLAR SUPPORTS
*	1,250	98	TRANSFORMER PAD
	10,700	96	Gravel surface, HSG A
	183,945	43	Weighted Average
	182,546		99.24% Pervious Area
	1,399		0.76% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment 5S: POST AREA C2

Hydrograph



POST CONDITIONS CHIPAWAY

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Summary for Subcatchment 6S: POST AREA C3

4-INCH OD ROUND STEEL PANEL SUPPORTS. EIGHT SUPPORTS PER PANEL TABLE.
IMPERVIOUS AREA PER PANEL TABLE IS 0.698 S.F.

10 INCH DIA UTILITY POLE A = 0.55S.F.

Runoff = 7.69 cfs @ 12.11 hrs, Volume= 0.689 af, Depth= 1.69"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.10-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=8.52"

Area (sf)	CN	Description
202,735	39	>75% Grass cover, Good, HSG A
* 210	98	SOLAR SUPPORTS
9,550	96	Gravel surface, HSG A
* 3	98	UTILITY POLES
212,498	42	Weighted Average
212,285		99.90% Pervious Area
213		0.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.5	15	0.0130	0.10		Sheet Flow, Grass: Short n= 0.150 P2= 3.31"
0.6	28	0.0130	0.80		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
1.5	91	0.0220	1.04		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
1.5	94	0.0220	1.04		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
6.1	228	Total			

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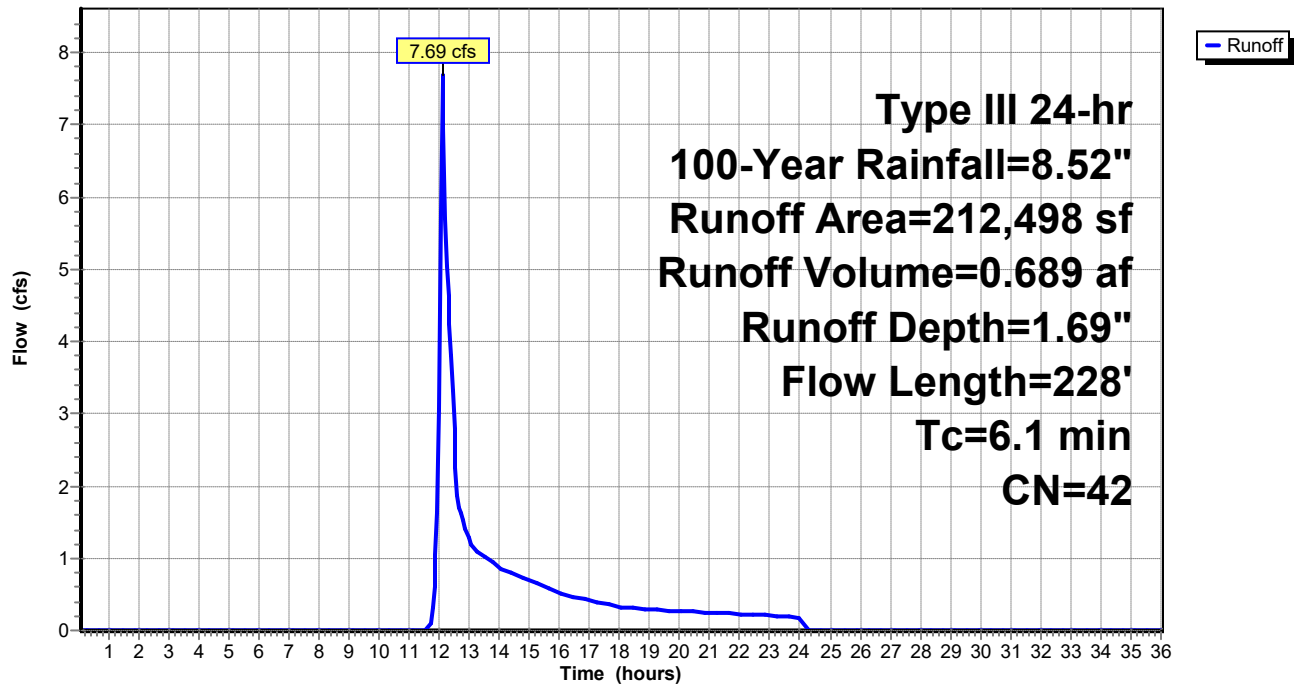
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Subcatchment 6S: POST AREA C3

Hydrograph



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Summary for Pond 1P: BASIN A1

Inflow Area = 1.440 ac, 2.05% Impervious, Inflow Depth = 2.24" for 100-Year event
 Inflow = 3.35 cfs @ 12.10 hrs, Volume= 0.268 af
 Outflow = 1.74 cfs @ 12.32 hrs, Volume= 0.268 af, Atten= 48%, Lag= 13.0 min
 Discarded = 1.74 cfs @ 12.32 hrs, Volume= 0.268 af
 Primary = 0.00 cfs @ 0.10 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.10-36.00 hrs, dt= 0.05 hrs
 Peak Elev= 93.94' @ 12.32 hrs Surf.Area= 31,171 sf Storage= 1,103 cf

Plug-Flow detention time= 4.9 min calculated for 0.268 af (100% of inflow)
 Center-of-Mass det. time= 4.9 min (879.7 - 874.9)

Volume	Invert	Avail.Storage	Storage Description
#1	93.90'	38,781 cf	BASIN A1 (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
93.90	30,901	704.0	0	0	30,901
95.00	39,797	779.0	38,781	38,781	39,790

Device	Routing	Invert	Outlet Devices
#1	Discarded	93.90'	2.410 in/hr Exfiltration over Surface area
#2	Primary	94.99'	12.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=1.74 cfs @ 12.32 hrs HW=93.94' (Free Discharge)
 ↑1=Exfiltration (Exfiltration Controls 1.74 cfs)

Primary OutFlow Max=0.00 cfs @ 0.10 hrs HW=93.90' (Free Discharge)
 ↑2=Orifice/Grate (Controls 0.00 cfs)

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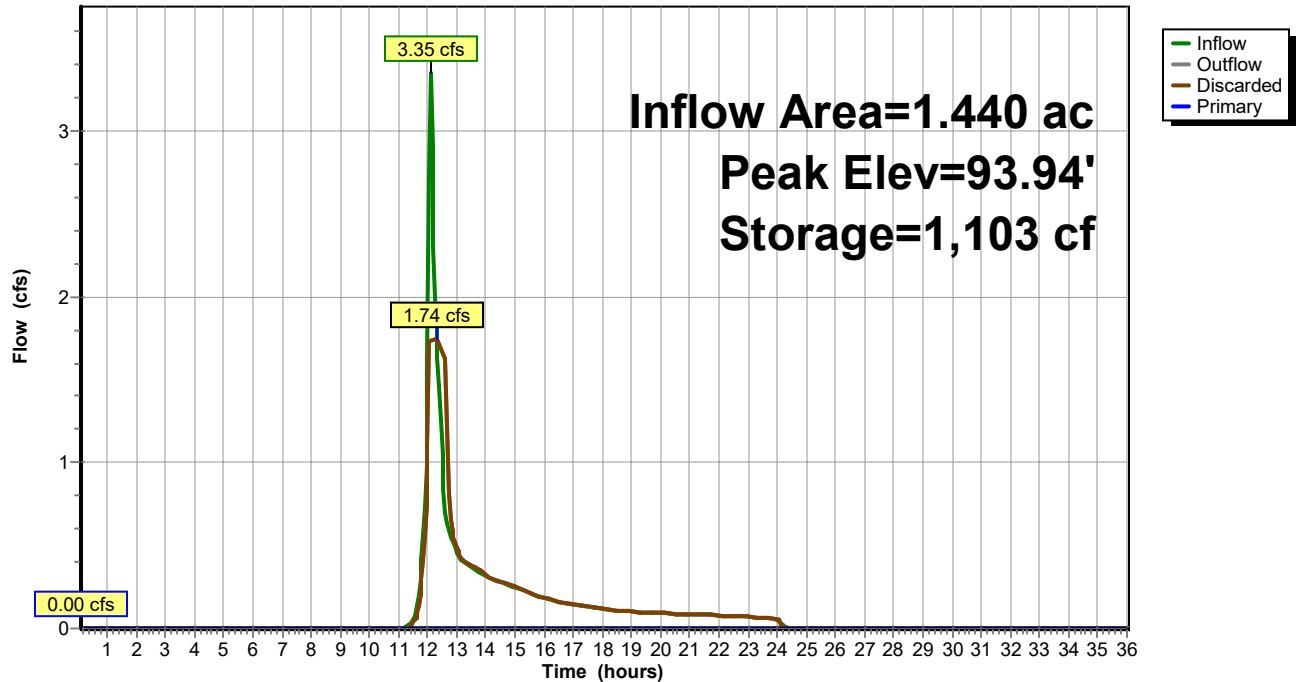
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Pond 1P: BASIN A1

Hydrograph



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Summary for Pond 2P: BASIN A2

Inflow Area = 6.866 ac, 0.09% Impervious, Inflow Depth = 1.91" for 100-Year event
 Inflow = 10.57 cfs @ 12.19 hrs, Volume= 1.092 af
 Outflow = 4.43 cfs @ 12.58 hrs, Volume= 1.092 af, Atten= 58%, Lag= 23.5 min
 Discarded = 4.43 cfs @ 12.58 hrs, Volume= 1.092 af
 Primary = 0.00 cfs @ 0.10 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.10-36.00 hrs, dt= 0.05 hrs
 Peak Elev= 92.49' @ 12.58 hrs Surf.Area= 79,394 sf Storage= 7,151 cf

Plug-Flow detention time= 9.7 min calculated for 1.090 af (100% of inflow)
 Center-of-Mass det. time= 9.7 min (899.4 - 889.7)

Volume	Invert	Avail.Storage	Storage Description
#1	92.40'	97,201 cf	BASIN A2 (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
92.40	77,692	1,788.0	0	0	77,692
93.50	99,485	1,864.0	97,201	97,201	99,870

Device	Routing	Invert	Outlet Devices
#1	Discarded	92.40'	2.410 in/hr Exfiltration over Surface area
#2	Primary	93.49'	12.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=4.43 cfs @ 12.58 hrs HW=92.49' (Free Discharge)
 ↑1=Exfiltration (Exfiltration Controls 4.43 cfs)

Primary OutFlow Max=0.00 cfs @ 0.10 hrs HW=92.40' (Free Discharge)
 ↑2=Orifice/Grate (Controls 0.00 cfs)

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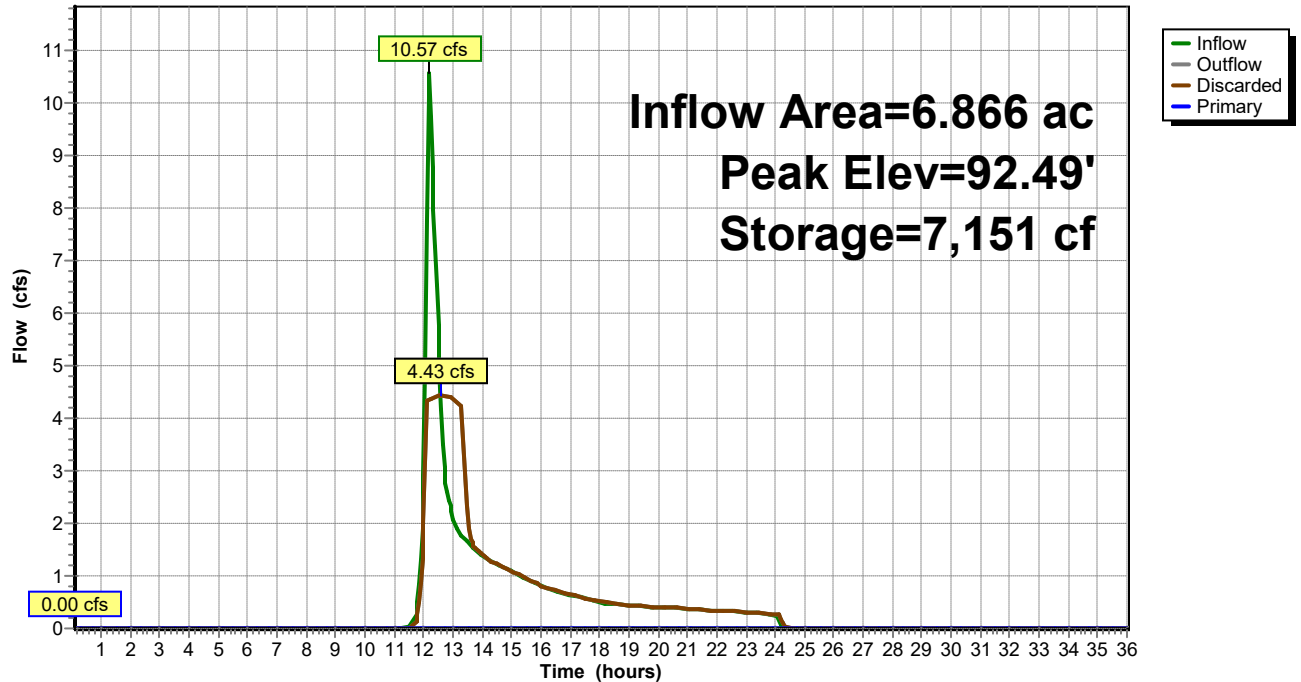
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Pond 2P: BASIN A2

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Summary for Pond 3P: BASIN A3

Inflow Area = 1.596 ac, 0.08% Impervious, Inflow Depth = 2.13" for 100-Year event
 Inflow = 3.47 cfs @ 12.11 hrs, Volume= 0.283 af
 Outflow = 0.30 cfs @ 14.44 hrs, Volume= 0.283 af, Atten= 91%, Lag= 140.3 min
 Discarded = 0.30 cfs @ 14.44 hrs, Volume= 0.283 af
 Primary = 0.00 cfs @ 0.10 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.10-36.00 hrs, dt= 0.05 hrs
 Peak Elev= 95.00' @ 14.44 hrs Surf.Area= 25,111 sf Storage= 4,942 cf

Plug-Flow detention time= 174.8 min calculated for 0.283 af (100% of inflow)
 Center-of-Mass det. time= 174.6 min (1,052.5 - 877.9)

Volume	Invert	Avail.Storage	Storage Description
#1	94.80'	33,179 cf	BASIN A3 (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
94.80	23,894	603.0	0	0	23,894
96.00	31,582	678.0	33,179	33,179	31,578

Device	Routing	Invert	Outlet Devices
#1	Discarded	94.80'	0.520 in/hr Exfiltration over Surface area
#2	Primary	95.99'	12.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.30 cfs @ 14.44 hrs HW=95.00' (Free Discharge)
 ↑1=Exfiltration (Exfiltration Controls 0.30 cfs)

Primary OutFlow Max=0.00 cfs @ 0.10 hrs HW=94.80' (Free Discharge)
 ↑2=Orifice/Grate (Controls 0.00 cfs)

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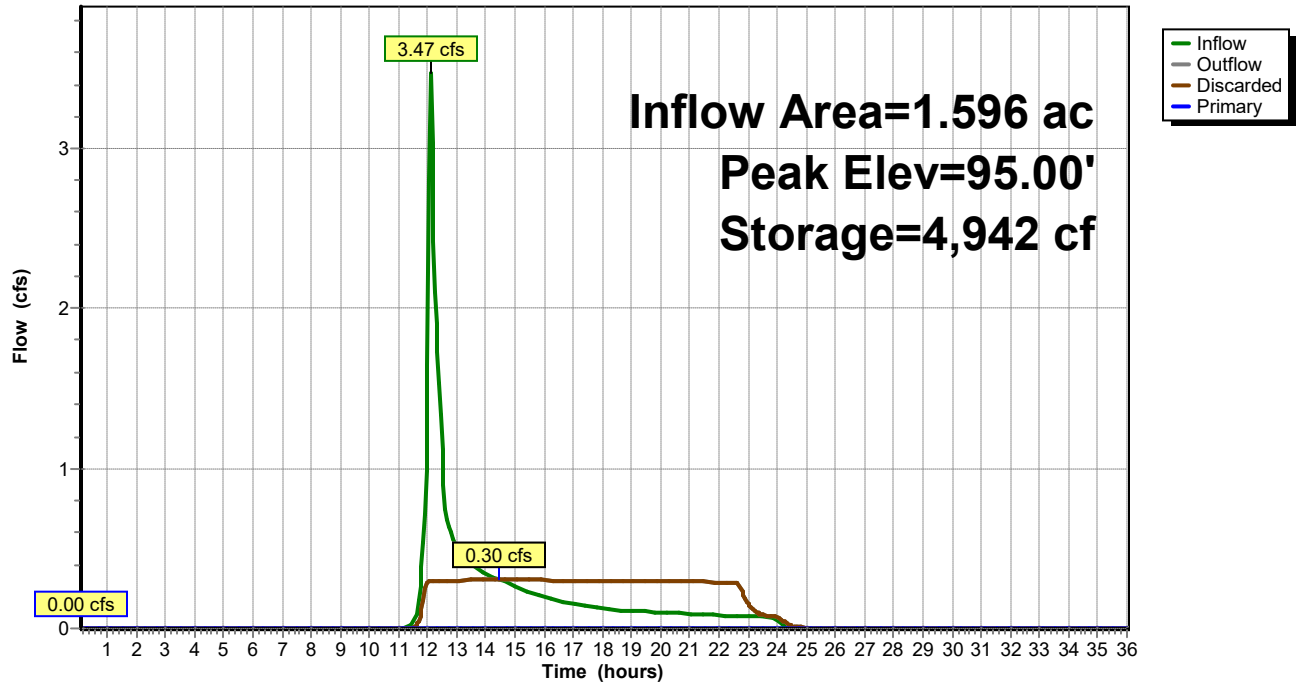
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Pond 3P: BASIN A3

Hydrograph



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Summary for Pond 4P: BASIN C1

Inflow Area = 4.242 ac, 0.76% Impervious, Inflow Depth = 1.80" for 100-Year event
 Inflow = 7.00 cfs @ 12.12 hrs, Volume= 0.637 af
 Outflow = 1.92 cfs @ 12.59 hrs, Volume= 0.637 af, Atten= 73%, Lag= 28.1 min
 Discarded = 1.92 cfs @ 12.59 hrs, Volume= 0.637 af
 Primary = 0.00 cfs @ 0.10 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.10-36.00 hrs, dt= 0.05 hrs
 Peak Elev= 92.66' @ 12.59 hrs Surf.Area= 34,499 sf Storage= 5,532 cf

Plug-Flow detention time= 18.3 min calculated for 0.636 af (100% of inflow)
 Center-of-Mass det. time= 18.3 min (907.4 - 889.1)

Volume	Invert	Avail.Storage	Storage Description
#1	92.50'	46,528 cf	BASIN C1 (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
92.50	32,983	1,458.0	0	0	32,983
93.70	44,867	1,512.0	46,528	46,528	45,869

Device	Routing	Invert	Outlet Devices
#1	Discarded	92.50'	2.410 in/hr Exfiltration over Surface area
#2	Primary	93.69'	6.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=1.92 cfs @ 12.59 hrs HW=92.66' (Free Discharge)
 ↑ **1=Exfiltration** (Exfiltration Controls 1.92 cfs)

Primary OutFlow Max=0.00 cfs @ 0.10 hrs HW=92.50' (Free Discharge)
 ↑ **2=Orifice/Grate** (Controls 0.00 cfs)

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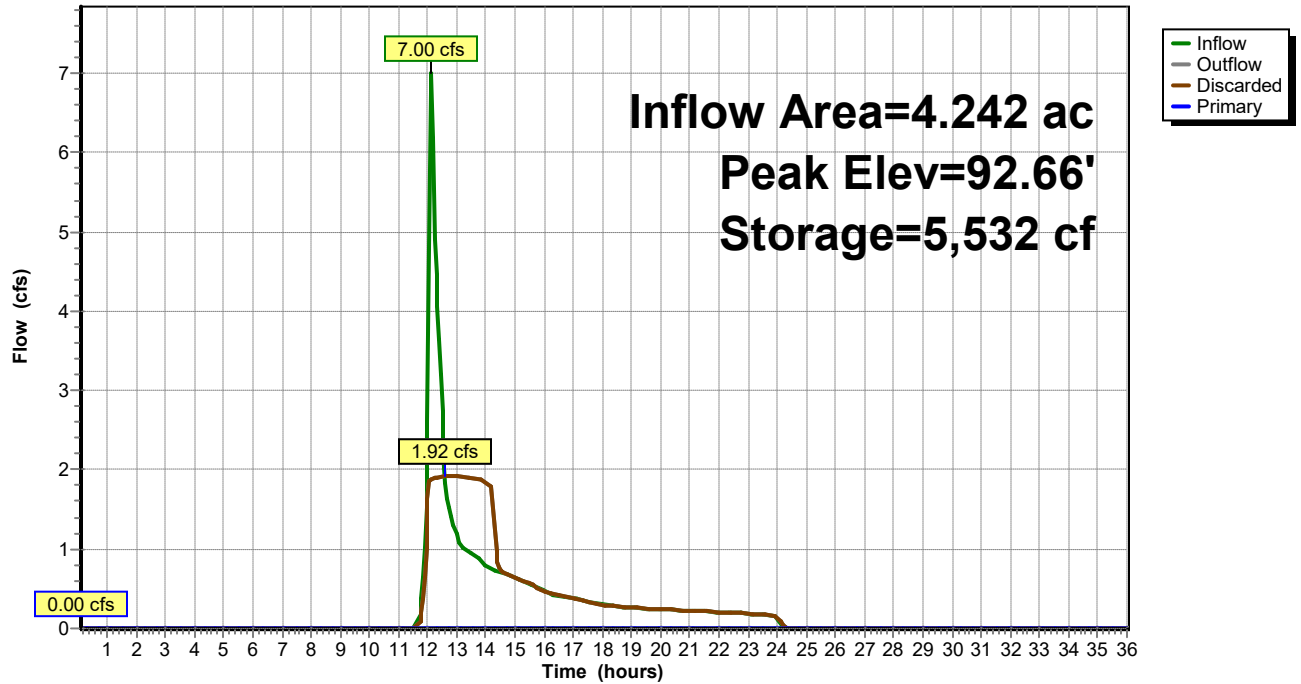
Type III 24-hr 100-Year Rainfall=8.52"

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Pond 4P: BASIN C1

Hydrograph



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Summary for Pond 5P: BASIN C2

Inflow Area = 4.223 ac, 0.76% Impervious, Inflow Depth = 1.80" for 100-Year event
 Inflow = 7.30 cfs @ 12.11 hrs, Volume= 0.634 af
 Outflow = 2.70 cfs @ 12.48 hrs, Volume= 0.634 af, Atten= 63%, Lag= 22.5 min
 Discarded = 2.70 cfs @ 12.48 hrs, Volume= 0.634 af
 Primary = 0.00 cfs @ 0.10 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.10-36.00 hrs, dt= 0.05 hrs
 Peak Elev= 95.89' @ 12.48 hrs Surf.Area= 48,378 sf Storage= 4,105 cf

Plug-Flow detention time= 9.3 min calculated for 0.633 af (100% of inflow)
 Center-of-Mass det. time= 9.3 min (897.3 - 888.0)

Volume	Invert	Avail.Storage	Storage Description
#1	95.80'	69,365 cf	BASIN C2 (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
95.80	46,907	1,774.0	0	0	46,907
97.00	69,436	1,851.0	69,365	69,365	69,225

Device	Routing	Invert	Outlet Devices
#1	Discarded	95.80'	2.410 in/hr Exfiltration over Surface area
#2	Primary	96.99'	6.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=2.70 cfs @ 12.48 hrs HW=95.89' (Free Discharge)
 ↑ **1=Exfiltration** (Exfiltration Controls 2.70 cfs)

Primary OutFlow Max=0.00 cfs @ 0.10 hrs HW=95.80' (Free Discharge)
 ↑ **2=Orifice/Grate** (Controls 0.00 cfs)

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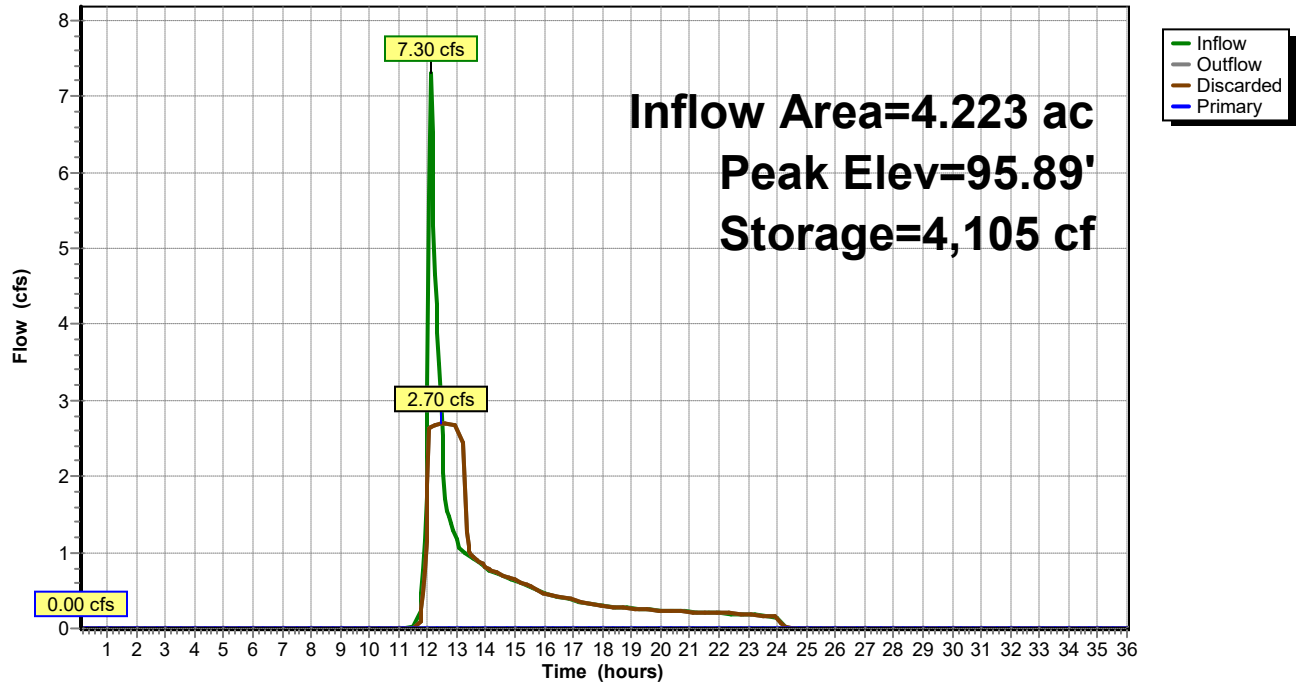
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Pond 5P: BASIN C2

Hydrograph



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Summary for Pond 6P: BASIN C3

Inflow Area = 4.878 ac, 0.10% Impervious, Inflow Depth = 1.69" for 100-Year event
 Inflow = 7.69 cfs @ 12.11 hrs, Volume= 0.689 af
 Outflow = 3.59 cfs @ 12.42 hrs, Volume= 0.689 af, Atten= 53%, Lag= 18.6 min
 Discarded = 3.59 cfs @ 12.42 hrs, Volume= 0.689 af
 Primary = 0.00 cfs @ 0.10 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.10-36.00 hrs, dt= 0.05 hrs
 Peak Elev= 94.85' @ 12.42 hrs Surf.Area= 64,351 sf Storage= 3,263 cf

Plug-Flow detention time= 6.2 min calculated for 0.688 af (100% of inflow)
 Center-of-Mass det. time= 6.2 min (898.0 - 891.8)

Volume	Invert	Avail.Storage	Storage Description
#1	94.80'	88,830 cf	BASIN C3 (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
94.80	63,497	1,743.0	0	0	63,497
96.00	85,079	1,855.0	88,830	88,830	95,637

Device	Routing	Invert	Outlet Devices
#1	Discarded	94.80'	2.410 in/hr Exfiltration over Surface area
#2	Primary	95.99'	6.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=3.59 cfs @ 12.42 hrs HW=94.85' (Free Discharge)
 ↑1=Exfiltration (Exfiltration Controls 3.59 cfs)

Primary OutFlow Max=0.00 cfs @ 0.10 hrs HW=94.80' (Free Discharge)
 ↑2=Orifice/Grate (Controls 0.00 cfs)

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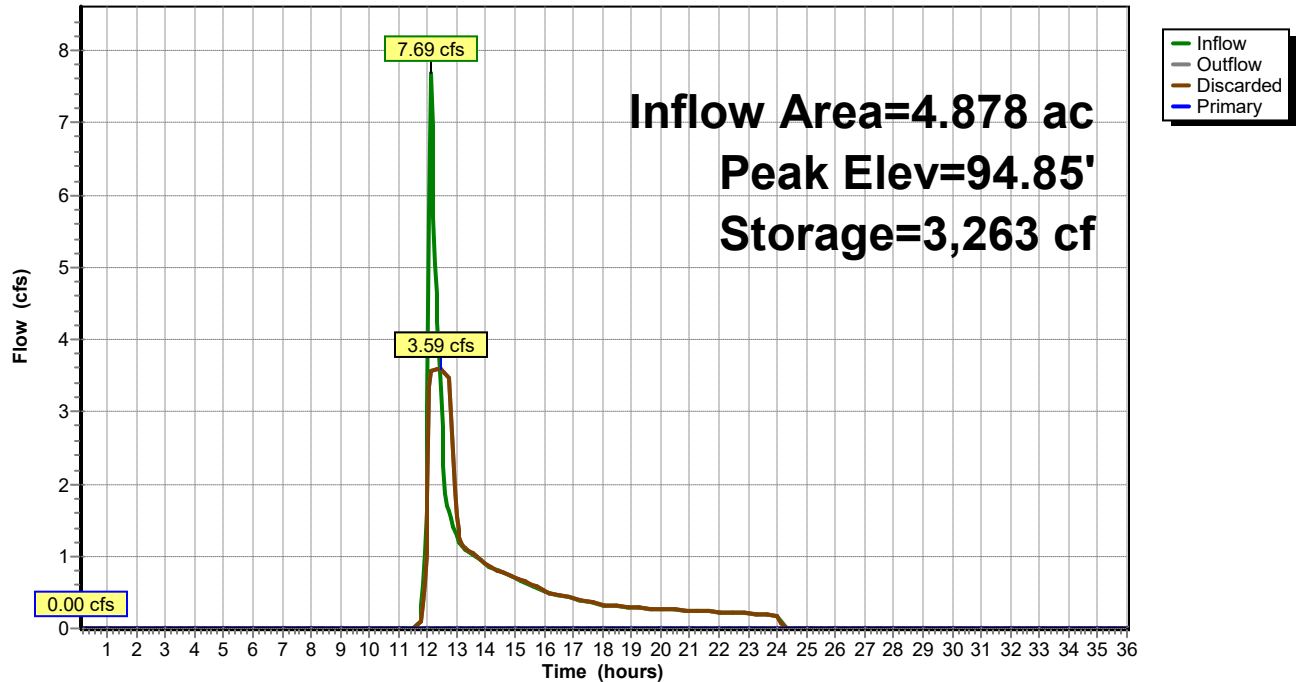
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Pond 6P: BASIN C3

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Type III 24-hr 2-Year Rainfall=3.31"

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Current Messages

- [13] Note: Time span=0.10-36.00 hrs, dt=0.05 hrs, 719 points
- [16] Note: Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
- [19] Note: Type III 24-hr 2-Year Rainfall=3.31"
- [22] Note: Reach routing by Stor-Ind method
- [25] Note: Pond routing by Stor-Ind method
- [28] Note: Updating Subcat 1S: POST AREA A1
- [28] Note: Updating Subcat 2S: POST AREA A2
- [28] Note: Updating Subcat 3S: POST AREA A3
- [28] Note: Updating Subcat 4S: POST AREA C1
- [28] Note: Updating Subcat 5S: POST AREA C2
- [28] Note: Updating Subcat 6S: POST AREA C3
- [28] Note: Updating Pond 1P: BASIN A1
- [28] Note: Updating Pond 2P: BASIN A2
- [28] Note: Updating Pond 3P: BASIN A3
- [28] Note: Updating Pond 4P: BASIN C1
- [28] Note: Updating Pond 5P: BASIN C2
- [28] Note: Updating Pond 6P: BASIN C3
- [28] Note: Updating Text 9T: PV ARRAY AREA "A"
- [28] Note: Updating Text 13T: PV ARRAY AREA "C"

POST CONDITIONS CHIPAWAY

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Type III 24-hr 10-Year Rainfall=4.88"

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Current Messages

- [13] Note: Time span=0.10-36.00 hrs, dt=0.05 hrs, 719 points
- [16] Note: Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
- [19] Note: Type III 24-hr 10-Year Rainfall=4.88"
- [22] Note: Reach routing by Stor-Ind method
- [25] Note: Pond routing by Stor-Ind method
- [28] Note: Updating Subcat 2S: POST AREA A2
- [28] Note: Updating Subcat 3S: POST AREA A3
- [28] Note: Updating Subcat 4S: POST AREA C1
- [28] Note: Updating Subcat 5S: POST AREA C2
- [28] Note: Updating Subcat 6S: POST AREA C3
- [28] Note: Updating Pond 2P: BASIN A2
- [28] Note: Updating Pond 3P: BASIN A3
- [28] Note: Updating Pond 4P: BASIN C1
- [28] Note: Updating Pond 5P: BASIN C2
- [28] Note: Updating Pond 6P: BASIN C3
- [28] Note: Updating Text 9T: PV ARRAY AREA "A"
- [28] Note: Updating Text 13T: PV ARRAY AREA "C"

POST CONDITIONS CHIPAWAY

Prepared by E. T. ENGINEERING ENT., INC.

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Type III 24-hr 100-Year Rainfall=8.52"

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Page 1

Current Messages

- [13] Note: Time span=0.10-36.00 hrs, dt=0.05 hrs, 719 points
- [16] Note: Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
- [19] Note: Type III 24-hr 100-Year Rainfall=8.52"
- [22] Note: Reach routing by Stor-Ind method
- [25] Note: Pond routing by Stor-Ind method
- [28] Note: Updating Subcat 1S: POST AREA A1
- [28] Note: Updating Subcat 2S: POST AREA A2
- [28] Note: Updating Subcat 3S: POST AREA A3
- [28] Note: Updating Subcat 4S: POST AREA C1
- [28] Note: Updating Subcat 5S: POST AREA C2
- [28] Note: Updating Subcat 6S: POST AREA C3
- [28] Note: Updating Pond 1P: BASIN A1
- [28] Note: Updating Pond 2P: BASIN A2
- [28] Note: Updating Pond 3P: BASIN A3
- [28] Note: Updating Pond 4P: BASIN C1
- [28] Note: Updating Pond 5P: BASIN C2
- [28] Note: Updating Pond 6P: BASIN C3
- [28] Note: Updating Text 9T: PV ARRAY AREA "A"
- [28] Note: Updating Text 13T: PV ARRAY AREA "C"